Vol. 941 Number 2

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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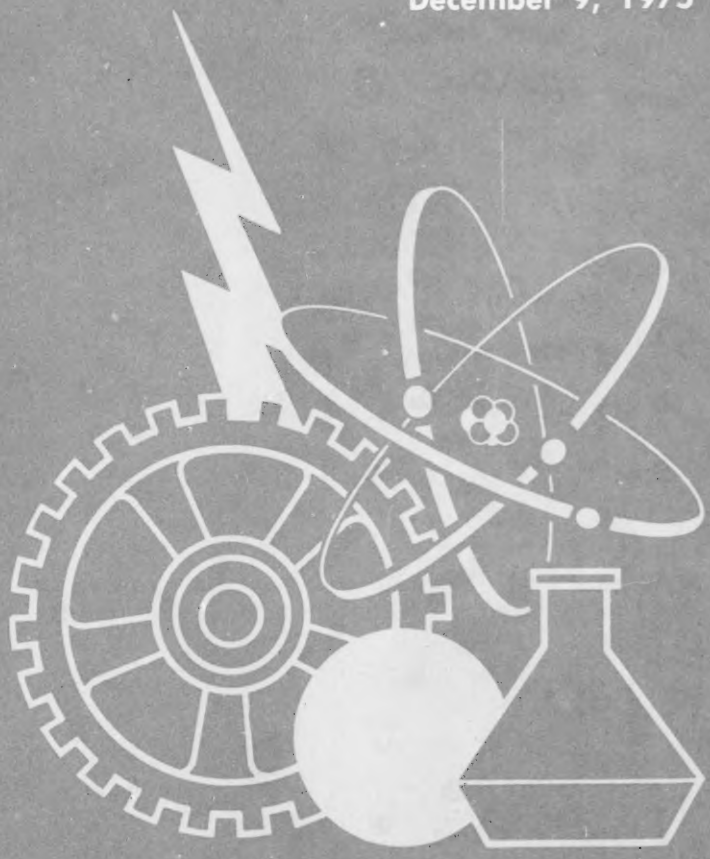
PATENTS

December 9, 1975



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UNITED STATES PATENT and TRADEMARK OFFICE

December 9, 1975 Volume 941 Number 2

CONTENTS

	Page
Patent and Trademark Notices	
Patent Suits	504
Patent Notices	
Certificates of Correction for the Week of December 9, 1975	505
Service by Publication	505
Patents Available for Licensing or Sale	505
Condition of Patent Applications	508
Reissue Patents Granted (28,639)	509
Plant Patents Granted (3,814)	512
Patents Granted	
General and Mechanical (3,924,271)	513
Chemical (3,925,006)	759
Electrical (3,925,592)	911
Design Patents Granted (237,914)	989
Index of Patentees	PI 1
Cross Reference of Published Patent Applications Published Under Trial Voluntary Protest Program	PI 50
Indices of Applicants of Reissues, Plants and Designs	PI 54
Classification of	
Patents (Including Reissues)	PI 57
Designs and Plants	PI 60
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 61
Designs and Plants	PI 63

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

3,142,367, Brown and Downing, CONTROLLED EXPANSION STRUCTURAL BEAM AND GRID STRUCTURE INCLUDING SAME; **3,175,655,** same; **3,297,345,** L. R. Downing, INTERLOCKING BEAM CONNECTORS; **3,388,519,** same, CONTROLLED EXPANSION STRUCTURAL BEAM AND GRID, **filed** Oct. 3, 1975, D.C., W.D.N.Y. (Buffalo), Doc. 75–412, *Roblin Hope's Industries, Inc.* v. *Donn Products, Inc. and Donn Corporation.*

3,175,655. (See 3,142,367.)

3,297,345. (See 3,142,367.)

3,388,519. (See 3,142,367.)

3,208,898, Chavannes and Fielding, APPARATUS FOR EMBOSSING AND LAMINATING MATERIALS; **3,416,984,** same, METHOD AND APPARATUS FOR MAKING CELLULAR MATERIAL FROM THERMOPLASTIC SHEETS; **Reg. No. 922,998** (BUBBLE WRAP), Sealer Air Corporation, **filed** Mar. 28, 1973, D.C., C.D. Calif. (Los Angeles), Doc. 73–662–RJK, *Sealed Air Corporation* v. *Richard Hossoff, an individual, doing business as Richard's Premiums and Bubble Pak, Inc.* Filed consent judgment and order thereon that court has jurisdiction, plaintiff is owner of patents, defendant has infringed on said patents, defendants' counterclaim is dismissed with prejudice and defendants are enjoined from further infringement of plaintiff's patents, entered June 6, 1975.

3,416,984. (See 3,208,898.)

3,476,232, Merwin and Weiss, PERMANENT MAGNETIC CONVEYOR AND ELEVATOR, **filed** Oct. 7, 1975, D.C., E.D. Mich. (Detroit), Doc. 75–71933, *Eriez Manufacturing Company* v. *Livonia Magnetics, Inc.*

3,481,129, Shepherd, Copple and Tattersall, OPEN END SPINNING APPARATUS, **filed** Oct. 10, 1975, D.C., N.D. Ill. (Freeport), Doc. 75–0051, *Platt Saco Lowell Ltd. et al.* v. *Spindelfabrik Suessen-Schurr, Stahlecker & Grill GmbH et al.*

3,553,737, J. Bauman, METHOD OF APPLYING HAIR, **filed** Sept. 29, 1975, D.C., C.D. Calif. (Los Angeles), Doc. 75–3296–WPG, *Dura-Hair International, Inc.* v. *Plus Hair Center of Beverly Hills, Inc.*

3,677,451, O. J. Burland, SUPPORTING BAR ASSEMBLY FOR VEHICLE, **filed** Aug. 29, 1974, D.C., N.D. Ill (Chicago), Doc. 74c2487, *Oliver J. Burland* v. *Trippe Manufacturing Company.* Enter judgment order in favor of plaintiff, Oct. 8, 1975.

3,731,442, N. T. McFarland, ELEMENTS HAVING ALTERNATING MUTUALLY PERPENDICULAR FORMATIONS PERMITTING INTERFITTING, **filed** Oct. 6, 1975, D.C.N.J. (Newark), Doc. 75–1743, *Plasteco, Inc.* v. *RCA Corporation.* Action transferred from the Southern District of Texas, Oct. 14, 1975.

3,742,908, D. H. Merino, ANIMAL HABITAT; **3,791,346,** Willinger and Dinnerstein, RODENT HABITAT; **3,859,961,** Gilbreath and Yeh, MULTIPLE SCENE LIGHTING CONTROLLER, **filed** Oct. 14, 1975, D.C. Colo. (Denver), Doc. 75–1080, *Mattel, Inc. and Metaframe Corporation* v. *Hartz Mountain Corporation.*

3,745,085, Bertrand and Moltzheim, TIRE BUILDING DRUM FOR POSITIONING A BEAD RING, **filed** Oct. 10, 1975, D.C., S.D.N.Y., Doc. 75–C–5042, *General Foods Corporation* v. *Harry Gorman.*

3,776,832, Oswin and Blurton, ELECTROCHEMICAL DETECTION CELL; **3,824,167,** same, GAS DETECTING AND MEASURING DEVICE, **filed** Oct. 6, 1975, D.C., S.D.N.Y., Doc. 75–C–4925, *Mine Safety Appliance Company and Catalyst Research Corporation* v. *Energetics Science, Inc.*

3,791,346. (See 3,742,908.)

3,802,945, B. G. James, HEAT SENSITIVE NOVELTY DEVICE, **filed** Oct. 2, 1975, D.C., S.D.N.Y., Doc. 75–C–4844, *Bill G. James* v. *Gimbel Brothers, Inc.*

3,831,017, W. F. Auer, SELECTOR TURRET FOR FIBER OPTIC, **filed** Oct. 10, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c3417, *Willmark Products, Co.* v. *American Hospital Supply Corp.*

3,824,167. (See 3,776,832.)

3,841,231, E. J. Hlinsky, SIDE FRAME KEY FOR RETAINING AN AXLE BEARING ASSEMBLY IN A RAILWAY TRUCK, **filed** Mar. 12, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c0790, *MacLean-Fogg Lock Nut Company* v. *R. W. Mac Co. and Robert W. MacDonnell.* Consent judgment, patent is valid and plaintiff is owner. Defendants are permanently enjoined from further infringment, Oct. 10, 1975.

3,859,961. (See 3,742,908.)

3,908,904, Kerner, Mahler and Peters, ULTRASONIC ATOMIZER FOR WASTE SULFURIC ACID AND USE THEREOF IN ACID CRACKING FURNACES, **filed** Oct. 14, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c3442, *Penntube Plastics Co. and National Soda Straw Co.* v. *Union Carbide Corporation.* **Same, filed** Oct. 14, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c3443, *Penntube Plastics Co. et al.* v. *Flexible Plastic Straw Corp.*

3,911,524, C. Parise, STEAM CLEANER DUMP BUCKET, **filed** Oct. 14, 1975, D.C. Colo. (Denver), Doc. 75–1073, *Parise & Sons, Inc.* v. *Magi-Clean, Inc.*

D. 230,658, W. R. Powell, MATERIAL HANDLING BOX; **D. 233,181,** same, STACKABLE MATERIAL HANDLING BOX, **filed** Oct. 14, 1975, D.C., E.D. Wis. (Milwaukee), Doc. 75–587, *Powell Pressed Steel Company* v. *Triple E Corporation.*

D. 233,181. (See D. 230,658.)

Reg. No. 922,998. (See 3,208,898.)

Certificates of Correction for the Week of Dec. 9, 1975

Re. 28,480	3,868,453	3,887,229	3,900,426
Re. 28,507	3,868,576	3,887,383	3,900,789
3,622,542	3,869,107	3,887,458	3,900,898
3,646,262	3,869,502	3,887,569	3,900,933
3,738,236	3,869,671	3,887,752	3,900,988
3,773,146	3,869,774	3,887,811	3,901,037
3,792,988	3,870,026	3,888,105	3,901,489
3,799,721	3,870,709	3,888,995	3,901,647
3,800,203	3,870,767	3,889,451	3,901,823
3,804,068	3,871,262	3,890,387	3,902,055
3,805,532	3,873,521	3,890,460	3,902,729
3,806,215	3,874,339	3,891,456	3,903,146
3,810,982	3,874,349	3,891,561	3,903,223
3,819,528	3,874,886	3,891,805	3,903,363
3,819,560	3,875,112	3,892,057	3,904,007
3,819,611	3,875,304	3,892,216	3,904,099
3,826,113	3,876,236	3,892,219	3,904,155
3,827,721	3,876,827	3,893,062	3,904,305
3,829,482	3,876,837	3,893,461	3,904,405
3,829,770	3,877,299	3,894,685	3,904,482
3,832,389	3,877,446	3,894,699	3,904,511
3,839,476	3,879,135	3,895,114	3,904,534
3,840,589	3,879,489	3,895,722	3,904,700
3,843,520	3,879,794	3,895,729	3,904,795
3,846,136	3,880,584	3,895,952	3,905,066
3,846,138	3,881,105	3,895,953	3,905,537
3,846,475	3,881,423	3,896,659	3,905,613
3,848,876	3,881,496	3,896,666	3,905,911
3,849,391	3,881,535	3,896,685	3,906,129
3,852,323	3,881,634	3,896,764	3,906,131
3,852,630	3,882,087	3,896,963	3,906,150
3,853,643	3,882,753	3,897,225	3,906,309
3,855,144	3,883,507	3,897,321	3,906,410
3,856,552	3,883,600	3,897,559	3,906,453
3,859,042	3,883,613	3,897,911	3,906,473
3,859,078	3,883,853	3,899,328	3,906,941
3,862,032	3,884,015	3,899,391	3,907,097
3,862,260	3,884,533	3,899,672	3,907,366
3,864,573	3,885,543	3,899,768	3,907,631
3,865,867	3,886,068	3,900,024	3,907,953
3,866,490	3,886,194	3,900,138	3,907,960
3,867,608	3,886,334	3,900,210	3,909,342
3,867,642	3,886,569	3,900,256	3,909,641
3,867,656	3,886,871	3,900,380	3,909,839

Service by Publication

Walter Zeitler

In accordance with 37 C.F.R. 1.47(a) (Rules of Practice in Patent Cases), notice is hereby given of the filing on November 25, 1974, of an application for patent entitled "Call Queue Release Control Circuit," on behalf of Walter Zeitler, whose last known address is 773 John Glenn Boulevard, Webster, New York 14580. The application was made in compliance with 37 C.F.R. 1.47(a) and 35 U.S.C. 116 by Siegfried Voise and Thomas M. Wagner without execution by the said Walter Zeitler. Notice of the filing directed to the above noted adress has been returned undelivered.

Any action to be taken by the said Walter Zeitler in connection with the said application must be taken within thirty days of the publication of this notice.

RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

Patents Available for Licensing or Sale

3,624,952. HUMANE ANIMAL TRAP. Arthur E. Gordon, 711 Austin Street, Sands Motel, Truth or Consequences, N. Mex. 87901.

3,826,717. QUANTITATIVE ANTIBIOTIC TEST CONTAINER. Dr. Verne E. Gilbert, 301 Blount Professional Building, Knoxville, Tennessee 37920.

The following 3 patents are offered by R. Douglas Rumsey, 148 Summer Street, Buffalo, New York 14222.

3,694,101. REENTRY CENTRIFUGAL PUMP/MIXERS.

3,833,317. ROTARY GEAR MOTOR/PUMP HAVING HYDROSTATIC BEARING MEANS.

3,860,982. CONVERTIBLE TRAILER/BOATS.

3,842,511. INTEGRAL HAND HELD TAILGATING DEVICE. Garth L. Young, Jr., 25441 Via Piedra Blanca Laguna Niguel, California 92677.

3,871,526. TOWEL RACK FOR USE ON BEACHES. Warren Marsack, 5075 Nottingham, Detroit, Mich. 48224.

3,873,119. BOWLING BALL CART. Clyde M. Koch, 3907 Bennington Street, Philadelphia, Pa. 19124.

3,873,152. ADJUSTABLE ORTHOPEDIC LOUNGER. John Garas, 6706 Jefferson, Merriville, Ina. 46410.

3,883,906. ARM PROTECTOR SLEEPING PILLOW. Alray Sumpter, P.O. Box 2657, Monrovia, Liberia, West Africa.

3,885,348. PROTECTIVE STORM DOOR. Edith Swearingen, 750 Shaker Drive, Apt. 305, Lexington, Kentucky 40504.

3,890,915. ANCHOR. Margarete L. Stinnes, New York, N.Y. Correspondence to: Michael J. Striker, 360 Lexington Avenue, New York, N.Y. 10017.

3,899,157. TACK FASTENER AND STRIPPER. Robert Thomas, 30 W. Chicago Ave., Chicago, Ill. 60610.

The following 2 patents are offered by Russell Jones, 6059 Bradshaw Road, Sacramento, Calif. 95826.

3,903,760. CIRCULAR SAW SHARPENING DEVICE.

3,904,198. EXERCISE BAR.

3,916,566. FIRE DOOR STRUCTURE AND FIRE SAFETY INSTALLATION INCLUDING SAID DOOR STRUCTURE. Jeane-Pierre Charles Lacombe, France. Correspondence to: Holman & Stern, 2401 Fifteenth Street NW., Washington, D.C. 20009.

3,916,854. FUEL-FLOW LIMITING APPARATUS. Richard E. Barton and Margaret M. Barton, 3627 Lauristen Place, Fairfax, Va. 22030.

General Electric Company is prepared to grant non-exclusive licenses under the following 44 patents upon reasonable terms to domestic manufacturers.

Application for license under the following 2 patents may be addressed to: General Electric Co., Transportation System Business Division, 2901 East Lake Road, Erie, Pa. 16531.

3,894,279. APPARATUS FOR SYNCHRONOUS SMOOTHING OF CURRENT RIPPLE.

3,897,843. ELECTRIC MOTORIZED WHEEL.

Application for license under the following 5 patents may be addressed to: General Electric Co., Division Patent Counsel, Transformer & Distribution Equip. Business Div., 100 Woodlawn Ave., Pittsfield, Mass. 01201.

3,388,320. VOLTAGE REGULATORS COARSE CONTROL DEVICE UTILIZING CURRENT LIMITING MEANS.

3,542,986. QUICK-MAKE, QUICK-BREAK ACTUATION FOR HIGH VOLTAGE ELECTRICAL CONTACTS.

3,586,802. LOAD BREAK DEVICE WITH ARC EXTINGUISHING MATERIAL.

3,691,291. SPLICE FOR JOINING HIGH VOLTAGE CABLES.

3,763,461. ELECTRIC CABLE TERMINATION MODULE HAVING A GAS-TRAP VALVE.

Application for license under the following 1 patent may be addressed to: General Electric Co., Division Patent Counsel, Housewares and Audio Business Division, 1285 Boston Ave., Bridgeport, Conn. 06602.

D. 236,763. DESIGN FOR HAND-HELD DRYER OR SIMILAR ARTICLE.

Application for license under the following 4 patents may be addressed to: General Electric Co., Appliance Components Business Division, 1635 Broadway, Fort Wayne, Ind. 46804.

3,507,765. METHOD FOR ELECTROCATING A POLYAMIDE ACID.

3,588,561. DYNAMOELECTRIC MACHINE STATOR AND LAMINATIONS FOR USE IN SAME.

3,605,466. APPARATUS FOR DRAWING METAL WIRE AND THE LIKE AND THE METHOD THEREOF.

3,650,167. METHOD OF MANUFACTURING MAGNETIC LAMINATIONS FOR DYNAMOELECTRIC MACHINE.

Application for license under the following 1 patent may be addressed to: General Electric Co., Division Patent Counsel, Space Division, P.O. Box 8555, Philadelphia, Pa. 19101.

3,906,367. METHOD AND APPARATUS FOR ERROR CORRECTION IN A DIGITAL DATA TRANSMISSION SYSTEM.

Application for license under the following 13 patents may be addressed to: General Electric Company, Patent Counsel, Silicone Products Department, Chemical and Metallurgical Division, Waterford, N.Y. 12188.

2,916,461. NOVEL ORGANOSILICON COMPOSITIONS.

2,924,601. BETA - (2 - PYRIDYL)ETHYLTRICHLOROSILANE AND PROCESS.

2,970,122. MIXED CATALYSTS FOR CURING SILICONE RESINS.

3,337,597. METHOD FOR MAKING ORGANOSILICON HYDRIDES.

3,378,575. PROCESS FOR MAKING CYCLOTETRASILOXANETETROL.

3,390,162. ORGANOSILICON COMPOUNDS AND METHOD OF MANUFACTURE.

3,391,109. ARYL KETONE CONTAINING ORGANOSILICON MATERIALS.

3,424,656. METHOD FOR RECOVERING ORGANOSILOXYSILANES BY DISTILLATION WITH A BASE CATALYST.

3,435,001. METHOD FOR HYDROLYZING ORGANOCHLOROSILANES.

3,439,008. METHOD FOR MAKING ORGANOMETALLIC HYDRIDES.

3,466,270. HYDROPYRIDINES, TRIORGANOSILYL HYDROPYRIDINES AND PROCESS FOR THEIR PREPARATION.

3,506,674. CERTAIN PYRIDYL THIOETHER SILANES.

3,523,056. STRETCHABLE SILICONE BONDED, COMPACTED GLASS FABRIC-POLYAMIDE LAMINATE TAPE AND METHOD FOR MAKING THE SAME.

Application for license under the following 18 patents may be addressed to: Patent Counsel, General Electric Company, Building #3, Room 216, Electronics Park, Syracuse, N.Y. 13201.

3,675,153. LASER OPTICAL CONFIGURATION.

3,679,996. FACE-PUMPED LASER DEVICE WITH LATERALLY POSITIONED PUMPING MEANS.

3,679,999. LASER COOLING METHOD AND APPARATUS.

3,703,390. CAPACITOR ENCAPSULANT AND METHOD OF FORMING.

3,708,739. REGULATED ELECTRICAL INVERTER SYSTEM.

3,719,424. RADIANT ENERGY SENSOR.

3,720,941. AUTOMATIC MONOPULSE CLUTTER CANCELLATION CIRCUIT.

3,728,725. TARGET DISPLAY FOR PULSE-ECHO RETURN SYSTEM.

3,744,120. DIRECT BONDING OF METALS WITH A METAL-GAS EUTECTIC.

3,746,081. HEAT TRANSFER DEVICE.

3,750,152. PULSE-ECHO PHASE DISCRIMINATOR USING DELTIC PROCESSING.

3,763,490. ADAPTIVE BEAMFORMER WITH TIME CONSTANT CONTROL.

3,766,634. METHOD OF DIRECT BONDING METALS TO NON-METALLIC SUBSTRATES.

3,769,541. LINE WIDTH MODULATED DISPLAY SYSTEM.

3,774,216. DIRECTION FINDER.

3,778,822. SUM-RANK NORMALIZED DETECTION APPARATUS.

3,778,825. ADAPTIVE QUANTIZING AND INTEGRATING DETECTOR FOR PULSE-ECHO SYSTEMS.

3,854,892. DIRECT BONDING OF METALS WITH A METAL-GAS EUTECTIC.

General Motors Corporation is prepared to grant nonexclusive licenses under the following 12 patents upon reasonable terms.

Application for license may be addressed to the Director, Patent Section, General Motors Building, 3044 West Grand Blvd., Detroit, Mich. 48202.

3,670,854. BRAKE PUMP AIR VALVE AND COOLING MEANS.

3,671,751. PHOTON ENERGY DETECTOR GENERATING SIGNAL IN WHICH DURATIONS OF 1ST AND 2ND HALF CYCLES ARE RESPONSIVE TO PHOTON ENERGY AND DIODE CONTINUITY RESPECTIVELY.

3,689,813. CYCLOCONVERTER SILICON CONTROLLED RECTIFIER GATE SIGNAL DELAY CIRCUIT.

3,702,429. CYCLOCONVERTER SILICON CONTROLLED RECTIFIER GATE-CATHODE CIRCUIT SIGNAL AND POWER SYSTEM.

3,705,642. TRANSMISSION CONTROL SYSTEM.

3,670,624. RAMMER HEAD.

3,681,676. CYCLOCONVERTER SILICON CONTROLLED RECTIFIER INHIBIT CIRCUIT.

3,685,528. TANK VENT.

3,686,895. DAMPED SHAFT COUPLING.

3,688,639. AMMUNITION CANISTER.

3,693,424. RING TESTING MACHINE.

3,699,850. FLUID ACTUATOR WITH LOCK AND CUSHION.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the following 48 patents.

Inquiries respecting licenses under RCA patents should be addressed to RCA Corporation, Staff Vice President, Domestic Licensing, 30 Rockefeller Plaza, New York, N.Y. 10036.

D. 236,780. CHECK-OUT COUNTER OR SIMILAR ARTICLE.

Re. 28,546. ADJUSTABLE POLARIZATION ANTENNA SYSTEM.

3,903,344. ADHERENT SOLDERABLE CERMET CONDUCTOR.

3,903,479. TRANSISTOR BASE BIASING USING SEMICONDUCTOR JUNCTIONS.

3,903,506. QUASI-CONSTANT RATE VECTOR GENERATOR.

3,903,656. GRINDING MACHINE FOR GENERATING A SURFACE OF REVOLUTION ON A HOLLOW WORKPIECE.

3,904,065. VACUUM SEAL FOR ENVELOPE PORTIONS.

3,904,488. TRUE REPLICATION OF SOFT SUBSTRATES.

3,904,818. REMOVAL OF DARK CURRENT SPIKES FROM IMAGE SENSOR OUTPUT SIGNALS.

3,904,888. CIRCUITS EXHIBITING HYSTERESIS USING TRANSISTORS OF COMPLEMENTARY CONDUCTIVITY TYPE.

3,904,927. VOLTAGE REDUCTION CIRCUIT FOR DEFLECTION YOKE.

3,904,931. OVERVOLTAGE PROTECTION CIRCUIT.

3,904,973. COMBINED AMPLIFIERS WHICH CONSUME SUBSTANTIALLY CONSTANT CURRENT.

3,904,976. CURRENT AMPLIFIER.

3,904,986. GAS LASER TUBE.

3,905,000. ELECTRONIC COMPONENT ASSEMBLY.

3,905,682. LIQUID CRYSTAL DEVICES OF IMPROVED CONTRAST.

3,905,683. DEFORMABLE MIRROR LIGHT VALVE FOR REAL TIME OPERATION.

3,905,691. FILM PROJECTOR APPARATUS.

3,906,258. FAILURE DETECTING AND INHIBITING CIRCUIT.

3,906,277. ELECTRON TUBE HAVING A SEMICONDUCTOR COATED METAL ANODE ELECTRODE TO PREVENT ELECTRON BOMBARDMENT STIMULATED DESORPTION OF CONTAMINANTS THEREFROM.

3,906,304. HIGH VOLTAGE PROTECTION CIRCUIT.

3,906,351. DIGITAL TUNING OF VOLTAGE CONTROL TELEVISION TUNERS.

3,906,408. FREQUENCY TRANSLATOR USING GYROMAGNETIC MATERIAL.

3,906,448. FAULT DETECTION FACILITATING MEANS FOR CARD READER OF IDENTIFICATION CARD READING SYSTEM.

3,906,501. APPARATUS FOR COPYING AN ELECTROSTATIC CHARGE PATTERN IN INTENSIFIED FORM.

3,906,508. MULTIMODE HORN ANTENNA.

3,907,290. ELECTRONIC SCORING SYSTEM FOR BOWLING ESTABLISHMENTS.

3,907,407. ELASTIC LIGHT-SCATTERING MODULAR DEVICE.

3,908,167. EXHAUST-RESPONSIVE ENGINE SPEED AND CONDITION INDICATOR.

3,908,185. HIGH FREQUENCY SEMICONDUCTOR DEVICE HAVING IMPROVED METALLIZED PATTERNS.

3,908,263. SEPARATE INTERDIGITAL ELECTRODES WITHOUT USING ANY SPECIAL PHOTOLITHOGRAPHIC TECHNIQUES.

3,908,981. SHEET WRAPPING AND UNWRAPPING APPARATUS.

3,909,111. CONTROLLED ANGLE VIEWING SCREENS BY INTERFERENCE TECHNIQUES.

3,909,123. INDEXING SYSTEM FOR MICROFICHE VIEWER.

3,909,225. CRYOGENIC DEWAR.

3,909,308. PRODUCTION OF LEAD MONOXIDE COATED VIDICON TARGET.

3,909,517. DISC RECORDS WITH GROOVE BOTTOM DEPTH VARIATIONS.

3,909,518. SIGNAL SWITCHING APPARATUS FOR COMPENSATING RECORD DEFECTS.

3,909,691. DIRECTION INDICATING DISPLAY SYSTEM.

3,909,727. DATA SIGNALING NOISE SUPPRESSION SYSTEM.

3,909,740. LUMPED ELEMENT, BROAD-BAND MICROWAVE APPARATUS USING SEMICONDUCTOR DIODES OPERATING IN THE TRAPATT MODE.

3,909,748. DIGITALLY CONTROLLED OSCILLATOR USING SEMICONDUCTOR CAPACITANCE ELEMENTS.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF NOVEMBER 8, 1975

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds: Inorganic Compositions: Organo-Metal and Organo-Metalloid Chemistry: Metallurgy: Metal Stock; Electro Chemistry: Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	2-3-75
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic. Amides; Alkaloids; Azo: Sulfur: Misc. Esters; Carbohydrates: Herbicides: Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy: Quinones: Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	12-3-74
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins: Rubber: Proteins: Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins: Natural Resins: Reclaiming: Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions: Molding, Shaping, and Treating Processes.	1-13-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating: Processes and Misc. Products: Laminating Methods and Apparatus: Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions: Bleaching: Dyeing and Photography.	1-6-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods: Fermentation; Analytical Chemistry: Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-7-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination: Horology; Acoustics; Recorders; Weighing Scales.	12-9-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	10-22-74
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	2-3-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food: Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	4-16-75
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-13-74
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	7-10-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	2-25-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools: Cutlery; Jacks.	2-6-75
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	2-18-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—R. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	1-6-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	4-14-75

Expiration of patents: The patents within the range of numbers indicated below expire during December 1975, except those which may have expired earlier due to shortened terms under the provisions of Public Law 600, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,862,205 to 2,866,972 inclusive
Plant Patents..... Numbers 1,775 to 1,791 inclusive

REISSUES

DECEMBER 9, 1975

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

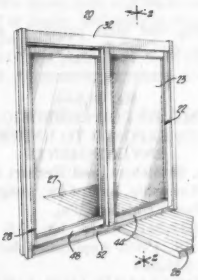
Re. 28,639
AUTOMATIC DOOR OPERATOR

Thomas H. Crocker, Howard Township, Cass County, Mich., assignor to Kawneer Company, Inc., Niles, Mich.

Original No. 3,619,946, dated Nov. 16, 1971, Ser. No. 93,093, Nov. 27, 1970. Application for reissue Nov. 9, 1973, Ser. No. 414,358

Int. Cl. E05f *13/04*

U.S. Cl. 49—264 **9 Claims**



1. An automatic door operator used in opening and closing a door which is mounted upon a door frame for sliding movement in a vertical plane between open and closed positions in response to movement of traffic adjacent the door, said door operator comprising:

a drive cylinder mounted in said door frame and having first and second air inlets;

a piston slidably movable within said drive cylinder between said first and second air inlets;

a cable drive means *extending through said cylinder and secured to said piston for* connecting said piston to said door;

a controlled source of compressed air connected to said first and second air inlets and operable to supply the compressed air to either of said first and second air inlets;

a control means coupled to said controlled source of compressed air and rendering said controlled source effective to supply compressed air to said first air inlet to move said piston toward said second air inlet in response to said traffic; and

cushioning assist means coupled to said control means and operable to render said controlled source effective to supply said air to said second air inlet to retard the movement of said drive piston for a short period of time.

Re. 28,640
METER HOUSING

John T. Sauriol, Dallas, Tex., assignor to Intercontinental Plastics Manufacturing, Dallas, Tex.

Original No. 3,717,963, dated Feb. 27, 1973, Ser. No. 121,480, Mar. 5, 1971. Application for reissue Jan. 15, 1975, Ser. No. 541,214

Int. Cl.² E02D *29/08*

U.S. Cl. 52—19 **7 Claims**

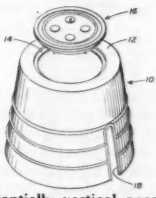
1. A water meter housing assembly comprising:

an upstanding wall defining a frustoconical housing having a cavity open to the bottom and top thereof,

an annular top member integral with said wall at the upper peripheral portion thereof,

an annular flange integrally formed about the inner periphery of said top member and recessed toward the interior cavity of said frustoconical housing, said annular flange defining an opening in the top of said housing,

a cover for said housing including a circular plate dimensioned to fit within the inner periphery of said annular top member and to abut against the upper portion of said annular flange, said cover further including an annular downwardly extending ring of a diameter to fit through said opening defined by said annular flange,



at least one substantially vertical opening to said cavity extending from the bottom portion of said wall to a predetermined location less than the height of said wall, and

a plurality of stabilizer rings extending about the circumference of said wall and vertically spaced along said wall to tend to prevent sinking of said housing.

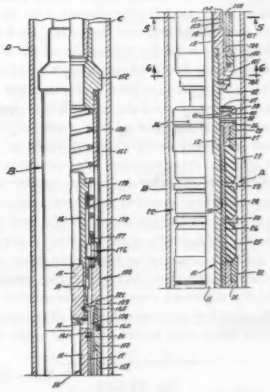
Re. 28,641
RETRIEVABLE SUBSURFACE WELL TOOLS

David V. Chenoweth, Maui, Hawaii, assignor to Baker Oil Tools, Inc., Los Angeles, Calif.

Original No. 3,361,207, dated Jan. 2, 1968, Ser. No. 394,402, Sept. 4, 1964. Application for reissue Aug. 7, 1974, Ser. No. 495,545

Int. Cl.² E21B *23/00, 33/12*

U.S. Cl. 166—120 **27 Claims**



17. In a well tool adapted to be set in a well bore: a body; normally retracted packing means on said body; means for expanding said packing means laterally outwardly, comprising abutment means for exerting an expanding force on said packing means; and chamber means surrounding said body and containing a gas under pressure charged into said chamber means at the top of the well bore for exerting a continuous spring-like force on said abutment means to hold said packing means expanded outwardly.

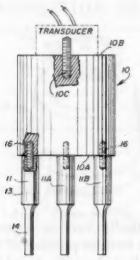
Re. 28,642
ULTRASONIC RIGID HORN ASSEMBLY

Paul H. Davis, St. Charles, Ill., assignor to Dukane Corporation, St. Charles, Ill.

Original No. 3,780,926, dated Dec. 25, 1973, Ser. No. 259,023, June 2, 1972. Application for reissue Oct. 17, 1974, Ser. No. 515,504

Int. Cl.[2] B23K *1/06, 5/20*

U.S. Cl. 228—1 **6 Claims**



6. An ultra-sonic tool system for industrial processing with acoustic energy, said system comprising an elongated, straight, rigid, unitary tool holder of rigid material having a longitudinal axis and a length of an intergral number of half-wave lengths at the operating frequency, the transverse dimensions being so proportioned to the length thereof as to minimize undesired modes of transmission other than along the tool holder length, said tool holder having only two ends shaped to provide finished flat sonic energy input and output areas, the tool holder providing a common transmission path for all sonic energy from the input to the output thereof, threaded means at the input end for coupling at least one source of sonic energy thereto; at least two, elongated, rigid tool members laterally spaced from each other each rigidly secured directly to a sonic output area of the tool holder, each tool member having at one end a sonic input area conforming to a sonic tool holder output area in the secured positions of the tool holder and tool members, each tool member having a sonic energy working output tip at its other end, the tool holder output area being great enough to accommodate a plurality of laterally offset secured tool members arranged to create a desired pattern of work areas, each tool member having a length of an integral number of half-wave lengths, said tool holder and tool members being each resonant to the acoustic energy so that efficient transmissions of sonic energy to the work areas result, each tool member being susceptible to individual design with regard to tool member contours, amplitude of sonic energy at a work area and physical length of a tool member, said tool system being sufficiently rigid so that it may be pressed against work without accessories for guiding tool members, at least one of said tool members having at least part of its length of a substantially different transverse dimension than corresponding parts of other tool members so that vibration amplitude differs from other tool members at the work areas.

Re. 28,643
ORNAMENTAL RAILING

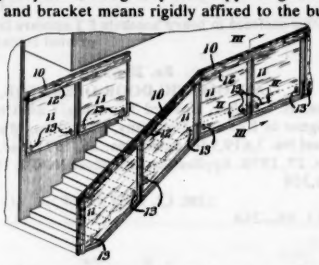
Harry P. Blum, Pittsburgh, Pa., assignor to Blumcraft of Pittsburgh

Original No. 3,358,969, dated Dec. 19, 1967, Ser. No. 513,261, Dec. 13, 1965. Application for reissue Dec. 6, 1974, Ser. No. 530,215

Int. Cl.[2] E04H *17/14*

U.S. Cl. 256—24 **9 Claims**

1. An ornamental railing comprising a continuous handrail, railing mounting means for connecting said handrail to a building structure and handrail supporting means connecting said mounting means and said handrails comprising a plurality of aligned glass panels, said glass panels supporting said handrail means, and bracket means rigidly affixed to the building



structure retaining said glass panels in substantially rigid spaced relation to said building structure.

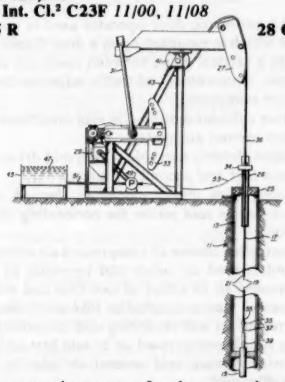
Re. 28,644
METHOD AND MEANS FOR CORROSION PROTECTION OF CABLES EXPOSED TO UNDERGROUND ENVIRONMENTS

James B. Horton, Bethlehem, and Herbert E. Townsend, Jr., Upper Saucon Township, both of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Original No. 3,637,341, dated Jan. 25, 1972, Ser. No. 888,551, Dec. 29, 1969. Application for reissue Jan. 22, 1974, Ser. No. 435,559

Int. Cl.[2] C23F *11/00, 11/08*

U.S. Cl. 21—2.5 R **28 Claims**



1. A corrosion protection system for the protection of cables in subatmospheric corrosive environments comprising:

a. a cable composed of a collection of individual wires,

b. a flexible outer jacket surrounding said cable and partially permeable to corrosion inhibiting liquid at least at the terminal end,

c. a supply of a liquid having a specific gravity substantially similar to the specific gravity of the [fluid constituents] *surrounding fluid medium* of the corrosive environment and being corrosion inhibiting with respect to said environment, and

d. means to introduce said liquid into one end of said cable within said outer jacket at a rate sufficient to maintain a small positive pressure in said cable with respect to said corrosive environment and to replace portions of said liquid passing from within said jacketed cable at least at the opposite terminal end of said cable.

17. A method for protecting plastic-jacketed cables from corrosive subatmospheric environments *where the cables are to be disposed with portions of the cable at substantially different subatmospheric levels in said corrosive environments* comprising *regularly* introducing a corrosion-inhibiting liquid having a specific gravity *selected to be substantially similar to the specific gravity of the surrounding fluid medium of the corrosive environment in which the cable is used and* substantially at least as great as the [principal fluid ingredient] *surrounding fluid*

medium of said corrosive environment into a portion of said cable at a rate sufficient to maintain a small positive pressure in said cable with respect to said corrosive environment *and continuously bathe the component wires of said cable in said corrosion inhibiting liquid* and to replace portions of said corrosion-inhibiting liquid passing from within said jacketed cable at least *through an opening extending through the plastic jacket* at an opposite terminal end of said cable.

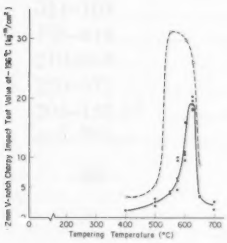
Re. 28,645
METHOD OF HEAT-TREATING LOW TEMPERATURE TOUGH STEEL

Koichi Aoki, Yokohama; Seinosuke Yano, Kamakura; Hiroshi Mimura; Tohru Inoue, both of Tokyo, and Hiroshi Sakurai, Kawasaki, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Original No. 3,619,302, dated Nov. 9, 1971, Ser. No. 776,421, Nov. 18, 1968. Application for reissue Nov. 5, 1973, Ser. No. 412,625

Int. Cl. C21d *1/26, 7/14*

U.S. Cl. 148—12 F **8 Claims**



1. A heat-treating method for producing a steel having an excellent toughness at an extremely low temperature and a high strength and good workability, from a steel consisting essentially of less than 0.20 wt.% C [.] , 0.05 to 0.40 wt.% Si, 0.10 to 5.0 wt.% Mn, 1.50 to 10.0 wt.% Ni as basic *alloying* component, *with the balance being Fe and the usual impurities*, comprising subjecting a hot-rolled steel plate having the said composition to a heat-treatment comprising heating to a temperature between the Ac_1 transformation point and the Ac_3 transformation point and a subsequent cooling from the said temperature at least at an air cooling rate and thereupon tempering the steel plate at a temperature below the Ac_1 transformation point [.] *but sufficiently high so as to cause precipitation or formation of fine austenite.*

Re. 28,646
REINFORCED POLYAMIDES AND PROCESS OF PREPARATION THEREOF

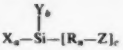
Ross Melvin Hedrick, Creve Coeur, and William R. Richard, Jr., St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Original No. 3,419,517, dated Dec. 31, 1968, Ser. No. 560,247, June 24, 1966. Continuation of Ser. No. 154,451, June 18, 1971, abandoned. Application for reissue June 20, 1973, Ser. No. 372,880

Int. Cl.² C08L *77/02*

U.S. Cl. 260—37 N **45 Claims**

1. A reinforced polymeric composition comprising a polyamide and at least about 25% by volume of an inorganic filler material having a length to diameter ratio of up to about 25 to 1, said material having been treated with an organosilane coupling agent of the formula



where X is a hydrolyzable group capable of reaction with a hydroxyl group, Y is hydrogen or a monovalent hydrocarbon group, R is an alkylene group having from 1 to about 20 carbon atoms, Z is a group capable of reaction with a polyamide, n is an integer from 0 to 1, a is an integer from 1 to 3, b is an integer from 0 to 2, c is an integer from 1 to 3 and the sum of a+b+c equals 4.

Re. 28,647
PREPARATION OF 3-4 DIDEOXYKANAMYCIN B ACTIVE AGAINST RESISTANT BACTERIA

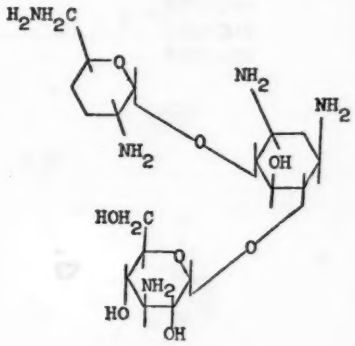
Sumio Umezawa; Hamao Umezawa, both of Tokyo, and Tsutomu Tsuchiya, Yokohama, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Original No. 3,753,973, dated Aug. 21, 1973, Ser. No. 149,351, June 2, 1971. Application for reissue May 1, 1974, Ser. No. 465,744

Int. Cl.² C07H *5/06*

U.S. Cl. 260—210 K **3 Claims**

3. The compound having the formula



Re. 28,648
PROCESS FOR CARRYING OUT CHEMICAL REACTIONS IN A FLUIDIZED BED

Mikhail Gavrilovitch Slinko, Novosibirsk, U.S.S.R., assignor to UCB Societe Anonyme, Brussels, Belgium, a part interest

Original No. 3,784,561, dated Jan. 8, 1974, Ser. No. 216,774, Jan. 10, 1972. Application for reissue Aug. 7, 1974, Ser. No. 495,519

Claims priority, application United Kingdom, Jan. 12, 1971, 1485/71

Int. Cl.² C07C *120/14; 121/02*

U.S. Cl. 260—465.3 **9 Claims**

1. In a catalytic fluid-bed process for the preparation of acrylonitrile wherein a gaseous mixture comprising propylene, ammonia and oxygen are passed through a reaction zone comprising fluidized catalyst particles and filling elements, the improvement wherein the filling elements consist of a plurality of windings of rigid material which is inert or catalytically active in relation to the gaseous reactants, the volume of which represents 2 to 12% of the volume occupied by the catalyst particles under the working conditions and the speed of displacement of the gaseous reactants through the reaction zone is from 0.25 to 0.95 times the speed of entrainment of the fluidized catalyst particles.

PLANT PATENTS

GRANTED DECEMBER 9, 1975

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,814

STRAWBERRY PLANT

Christian Olson, Rte. 1, Box 61, Aurora Township, Waushara County, Berlin, Wis. 54923

Filed Jan. 6, 1975, Ser. No. 538,961

Int. Cl. A01h *5/03*

U.S. Cl. Plt.—49 **1 Claim**

1. The new and distinct variety of strawberry plant herein described and identified by the characteristics enumerated above.

PATENTS

GRANTED DECEMBER 9, 1975

ERRATA

For CLASS	See PATENT NO.
214-016.4	3,924,300
053-380	3,924,375
164-304	3,924,422
096-033	3,924,520
328-051	3,924,614
172-413	3,924,694
074-242.4	3,924,833
285-340	3,924,877
021-105	3,925,014
156-618	3,925,108
210-038	3,925,192
250-372	3,925,244
204-159.15	3,925,349
423-394	3,925,428

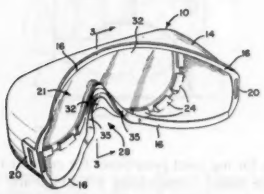
PATENTS

GRANTED DECEMBER 9, 1975

NOTE – A cross reference listing of applications published under Trial Voluntary Protest Program on January 28, 1975 is located in the back of this Issue. These entries will be in numerical order by document publication number.

GENERAL AND MECHANICAL

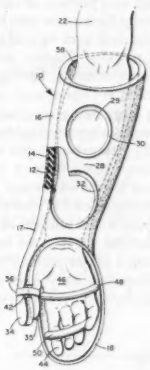
3,924,271
GOGGLES
Jack B. Hirschmann, Jr., Buzzards Bay, Mass., assignor to H. L. Bouton, Company, Buzzards Bay, Mass.
Filed Sept. 9, 1974, Ser. No. 504,051
Int. Cl.[2] A61F *9/02*
U.S. Cl. 2—14 D **6 Claims**



1. A goggle frame including a front rim and rearwardly extending, peripheral wall substantially completely surrounding said front rim and defining an eye chamber having a reduced portion above and adapted to receive the nose of the wearer, a lens received within said rim, and head strap means attached to said wall for supporting said frame on the head of the wearer, and further characterized by bridge structure for receiving the nose of the wearer composed of a first means comprising saddle portions of said rim and wall defining a recess for receiving the nose of the wearer, a second means comprising a pad means connecting the upper ends of the forward edges of said saddle portions and adapted to seat on the bridge of the wearer's nose, and a third means comprising skirt members integral with and extending toward each other into said recess in substantially the same plane from the rearward edges of said saddle portions, said skirt members being relatively thin and flexible for outward deflection into yieldable overlying engagement with the sides of the wearer's nose to seal the spaces between the nose and said saddle portions.

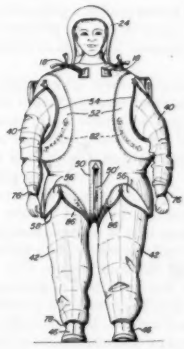
3,924,272
PROTECTIVE DEVICE FOR USE BY FOOTBALL ATHLETES
George H. Allen, 1055 Leigh Mill Road, Great Falls, Va. 22066, and Jhoon Goo Rhee, 2525 N. Ridgeview Road, Arlington, Va. 22207
Filed May 3, 1974, Ser. No. 466,821
Int. Cl.[2] A41D *13/08*
U.S. Cl. 2—16 **19 Claims**

1. A protective device for use in athletic contests such as football and the like comprising molded casing means having resilient foam means disposed therein; said casing means having portions shaped to conform and to be worn on an athlete's thumb, hand, wrist, arm and elbow; said arm and wrist portions having a generally cylindrical configuration; said hand and thumb portions adapted to cover at least the backs of the palm, fingers, and thumb; said elbow portion adapted to extend beyond the back of the elbow and the upper inner part of said arm portion extending to a point below the inner part of said elbow, whereby an opening for inserting the hand and arm is defined; the planes of said elbow portion and said hand portion being suitably disposed in conjunction with said opening to accommodate bending of the elbow; and



securing means for retaining said device on the hand, wrist and arm.

3,924,273
SLEEP-WALKER BAG
Betty J. Donovan, P.O. Box 1003, Hamilton, Mont. 59840
Filed Jan. 22, 1974, Ser. No. 435,503
Int. Cl.[2] A41D *15/04*; **A47G** *9/00*
U.S. Cl. 2—69.5 **20 Claims**



1. In combination with an elongated sleeping bag of the type including head and foot ends and a central entrance and exit portal at least adjacent the terminal end of the head end of said bag, a pair of transversely spaced opposite side closed periphery arm openings formed in said head end portion of said bag and a pair of opposite side closed periphery leg openings formed in said bag spaced longitudinally of said bag from said arm openings toward said foot end and disposed generally centrally intermediate the opposite head and foot ends of said bag, first and second pairs of flexible tubular arm and leg receiving components, respectively, having at least one set of corresponding ends which are open, said one set of open ends

of said tubular components being secured to said bag about said arm and leg openings whereby said bag is adapted to be used as a walker, and supporting means on said bag for supporting the foot end of the bag below said leg opening behind the back of the wearer of the bag when the latter is used as a walker

14. In combination with an elongated sleeping bag of the type including head and foot ends and a central entrance and exit portal at least adjacent the terminal end of the head of said bag, a pair of transversely spaced opposite side arm openings formed in said head end portion of said bag and a pair of opposite side leg openings formed in said bag spaced longitudinally of said bag from said arm openings toward said foot end, first and second pairs of flexible tubular arm and leg receiving components, respectively, having at least one set of corresponding ends which are open, said one set of open ends of said tubular components being secured to said bag about said arm and leg openings, whereby said bag is adapted to be used as a walker said bag comprising a full length mummy bag, said arm and leg openings being formed in the opposite side portions of the head and foot ends thereof, said bag including a bag encircling drawstring assembly spaced slightly above the leg openings and adapted to be utilized to draw the adjacent portion of said bag about the waist of the wearer when the bag is being used as a walker, a major portion of said bag disposed between said drawstring assembly and said arm openings being foldable downwardly and over the exterior of said drawstring assembly.

3,924,274

ADJUNCT AND METHOD FOR FACILITATING IMPLANTATION OF JOINT PROSTHESES

Gunther Heimke, Mannheim; Peter Griss, Plankstadt, and Hanns Frhr. von Andrian-Werburg, Ilvesheim, all of Germany, assignors to Friedrichsfeld GmbH Steinzeug-und Kunststoffwerke, Mannheim, Germany

Filed July 3, 1974, Ser. No. 485,617

Claims priority, application Germany, July 7, 1973, 2334643

Int. Cl.² A61F *1/24*

U.S. Cl. 3—1.91 **7 Claims**

1. An aid for use in the process of implanting of a prosthesis in a bone cavity which has been prepared to receive said prosthesis and which includes the application of a mineral cement to the surface of a prosthesis capable of hardening only in a biologically fluid-free environment, comprising a hollow pouch closed at one end and open at the other composed of a barrier film of biologically compatible impermeable material to be disposed between said applied cement and the entire surface of the prepared cavity within which the prosthesis is to be implanted, said impermeable material being resorbable in a biological environment.

3,924,275

ARTIFICIAL JOINT PROSTHESIS USING Al_2O_3 MATERIAL

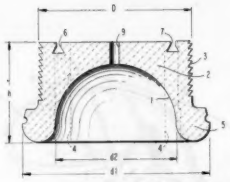
Gunther Heimke, Mannheim; Peter Griss, Plankstadt, and Hanns Frhr. von Andrian-Werburg, Ilvesheim, all of Germany, assignors to Friedrichsfeld GmbH Steinzeug-und Kunststoffwerke, Mannheim, Germany

Filed May 3, 1974, Ser. No. 466,640

Claims priority, application Germany, May 17, 1973, 2324865; May 19, 1973, 2325585

Int. Cl.² A61F *1/24*

U.S. Cl. 3—1.912 **14 Claims**



1. A socket for hip joint prostheses for cement-free implantation in bone tissue, comprising a biologically compatible material such as compacted Al_2O_3 ceramic, said socket being provided with an internal hemispherical cavity, an exterior upper load bearing surface portion of the socket being provided with at least one elongated groove to provide a direct physical connection with bone tissue grown after implantation and an exterior surface portion including means to prevent rotation of the socket directly after implantation, the overall height of the socket being less than the diameter of the hemispherical cavity, the transverse dimensions of the upper portions of the socket being less than the largest diameter of the socket but, larger than the diameter of the hemispherical cavity.

3,924,276

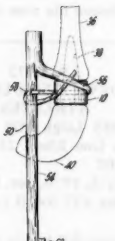
SURGICALLY IMPLANTABLE TRAPEZIUM PROSTHESIS AND METHOD OF RECONSTRUCTING THE THUMB CARPOMETACARPAL JOINT

Richard E. Eaton, 640 Ely Ave., Pelham Manor, N.Y.

Filed Feb. 18, 1975, Ser. No. 550,173

Int. Cl.² A61F *1/24*

U.S. Cl. 3—1.91 **5 Claims**



1. A prosthesis for the trapezium of the thumb metacarpal joint comprising an integral, elastomeric member configured to include a generally cylindrical portion, having extending from one end thereof an elongated, longitudinally extending tapered portion, and wherein said cylindrical portion includes a transverse aperture extending through the longitudinal axis of said prosthesis.

3,924,277

KNEE JOINT PROSTHESIS

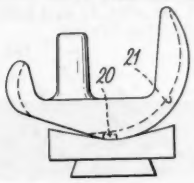
Michael Alexander Reykers Freeman, London, and Sydney Alan Vasey Swanson, Carshalton, both of England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 247,873, April 26, 1972, abandoned. This application Mar. 4, 1974, Ser. No. 447,993

Claims priority, application United Kingdom, May 4, 1971, 12919/71

Int. Cl.[2] A61F *1/24*

U.S. Cl. 3—1.911 25 Claims



14. A prosthetic knee joint device comprising: a femoral bearing member of generally U-shaped form having a first side wall, a base, and a second side wall, defining relative to said U-shape a major outer surface and a major inner surface, said outer surface having a convex first profile extending in a circumferential direction around said U-shape and including a convexly curved first profile part extending over said first wall and partway across said base, a relatively flat second profile part continuing across said base from said first profile part, and a convexly curved third profile part continuing across said second wall from said second profile part;

and a tibial bearing member in the form of a platform having a major upper surface and a major lower surface, said upper surface being dished in one direction thereacross to provide a concave second profile generally complementary to said convex first profile, said concave second profile including a concavely curved central profile part of the same order of curvature as and in mutual articulatory bearing engagement with said first profile part, and a relatively flat outer profile part continuing from said central profile part in similar angular relationship therewith to that between said femoral first and second profile parts, said femoral second and tibial outer profile parts engaging to limit said articulatory engagement.

3,924,278

BATHTUB

Lars Gustaf Ekman, Helsingborg, Sweden, assignor to Olle Blomqvist Rehab-Produkter AB, Stockholm, Sweden

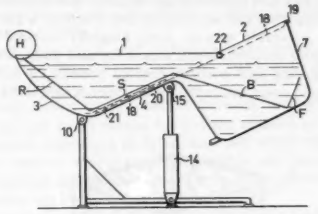
Filed Sept. 21, 1973, Ser. No. 399,285

Claims priority, application Sweden, Sept. 28, 1972, 12522/72

Int. Cl.[2] A47K *3/02*

U.S. Cl. 4—176 7 Claims

1. Bathtub means comprising a bathtub, a substantially horizontal pivot for said bathtub extending transversely of the longitudinal axis thereof for pivotally mounting said bathtub for pivotal movement between a lower entering position and a higher bathing position, said bathtub comprising two distinct and individual portions and a convex surface discontinuity therebetween, one of said portions being a seat and back portion and the other of said portions being a foot portion, said foot portion having at its top a substantially U-shaped edge as seen in plan view for defining said convex surface discontinuity, the seat portion of said bathtub being at least as high as said U-shaped edge when said tub is in said entering position and being lower than said U-shaped edge in said bathing position, said convex discontinuity being out of flow block relationship between said seat portion and said foot portion when said bathtub is in said bathing position, whereby



bath water can flow from the foot portion to the seat and back portions when the bathtub is pivoted to the bathing position.

3,924,279

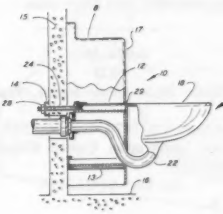
HANGER AND SUPPORT STRUCTURE FOR TOILET BOWLS AND THE LIKE

Earl L. Morris, and Theodore J. Sally, both of Whittier, Calif., assignors to Acorr Engineering Company, Industry, Calif.

Filed Dec. 18, 1974, Ser. No. 533,849

Int. Cl.[2] F16L *21/02*

U.S. Cl. 4—252 R 12 Claims



1. A structure for hanging and supporting a wall hung combination toilet and housing on a mounting wall, wherein said toilet bowl is mounted to the front sidewall of said housing, comprising:

a. a tension member having two ends, one end of which is attached to said toilet bowl at a point which lies substantially in the same plane where the major portion of the loading occurs and the opposite end of which is sufficiently long so as to project beyond the opposite surface of said mounting wall;

b. a structural member with an opening therein for receiving said opposite end of said tension member projecting beyond the opposite surface of said mounting wall;

c. means for securing said tension member to said structural member after said tension member has been disposed through said opening in said structural member;

d. means for adjusting the tension of said tension member so as to place said structural member in an intimate abutting relationship to said mounting wall; and

e. means for maintaining a fixed spatial relationship between the lower portion of said toilet bowl where it joins the front sidewall of said housing and said mounting wall.

3,924,280

PORTABLE PLAY PEN

Vincent Vaiano, South Ozone Park, NY

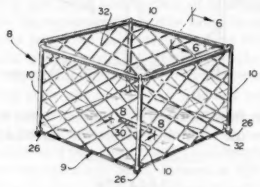
Filed June 7, 1974, Ser. No. 477,196

Int. Cl.[2] A47D *9/00, 7/00*

U.S. Cl. 5—98 R 6 Claims

1. A portable, foldable play pen comprising a floor made of a plurality of flat triangular sections having a base and inter-

secting sides, a plurality of flat quandrangular sections arranged alternately of said triangular sections, a plurality of flat spacers disposed adjacent intermediate one of the sides of said triangular and said quadrangular sections, means permanently hingedly securing said sections to one another, a plurality of vertically erectable spaced posts hingedly secured to said quadrangular sections, hinge means for said posts, means for rigidly securing said posts in erected position, a netting secured to said posts and to the outer edges of said sections, said

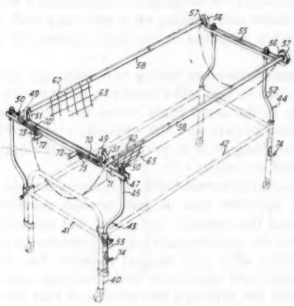


netting forming walls of said play pen and bumpers attached to the top portions of said posts and top edges of said netting, said triangular, said quadrangular sections, when folded in accordion-like fashion, forming chambers with spacers for receiving said posts, said hinge means being a pair of angularly disposed plates terminating as hinge pins opposed to one another said plates being secured to said foldable sections, posts having lower end portions provided with a first pair of aligned holes for receiving said hinge pins.

3,924,281
BED

John Reynell Gibbs, Stone Cross House, Wadhurst, Sussex, England

Filed Sept. 12, 1974, Ser. No. 505,577
Claims priority, application United Kingdom, Mar. 13, 1974, 11223/74
Int. Cl.[2] A61G 7/10
U.S. Cl. 5—81 R **5 Claims**

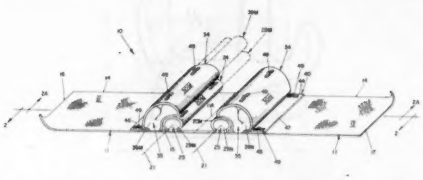


1. A bed comprising, in combination:
a. a pair of elongate members;
b. means for mounting said members so that their axes are substantially parallel;
c. on each elongate member, a plurality of radially outwardly projecting pins arranged in a line parallel to the axis of the elongate member;
d. at least one wide mesh web of net material extending between said members and secured thereto, by hooking over said radially outwardly projecting pins;
e. hoop portions connected to said elongate members and extending radially outwardly therefrom along the line of said pins;
f. curved cross section locking bars securable under said hoops effective to retain the net material in position on said pins;
g. means for rotating said members about their axes; and
h. means for locking said members against rotation.

3,924,282
THERAPEUTIC PROP-LIKE SUPPORT FOR HEMISIDE RECLINING PERSONS

Helen Inez Bond, 709 Olson Road, Longview, Wash. 98632

Continuation of Ser. No. 481,557, June 21, 1974, abandoned.
This application June 2, 1975, Ser. No. 583,108
Int. Cl.[2] A47C 21/00
U.S. Cl. 5—327 R **11 Claims**

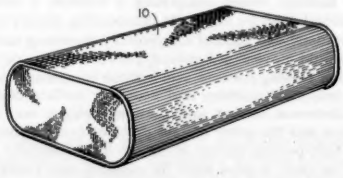


1. A therapeutic prop-like support for maintaining a sleeping or otherwise reclining person in a hemiside position, said prop-like support comprising:
A. An elongated and relatively narrow flexible web-like drawsheet that is superimposeable upon a bed horizontal surface at a selectable angle to the lengthwise central-axis of a bed having two parallel lengthwise-terminii, said drawsheet including a pair of lengthwise longitudinal-edges including a leadward first-edge and a trailward second-edge, said drawsheet having a pair of opposed elongate broad surfaces including a topside and also a bottomside that is directly superimposeably abuttable against the bed horizontal surface; and
B. A pair of longitudinally separated and substantially parallel primary-sleeves attached to the web-like drawsheet and extending laterally along the topside thereof, the primary-sleeves being sufficiently longitudinally separated so as to be respectively located on opposite outboardsides of and substantially parallel to an ascertainable central lateral-reference for the prop-like support, each of said primary-sleeves being adapted to removably accommodate therewithin a fairly firm bolster type cushion, said bolster extending along a bolster-axis and having a fixed axial-length said cushion being of lofty thickness as compared to the underlying drawsheet.

3,924,283
CUSHION CONSTRUCTION

Robert C. Shave, 33 Sutton SW., Grand Rapids, Mich. 49507

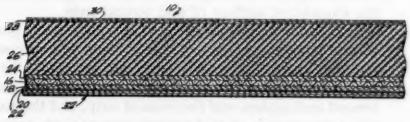
Filed Aug. 5, 1974, Ser. No. 494,713
Int. Cl.[2] A47G 9/00; A47C 27/00
U.S. Cl. 5—338 **4 Claims**



1. A pillow having both foamed resilient material and a padding within a cover, wherein the improvement comprises: a configuration of said foamed resilient material including a

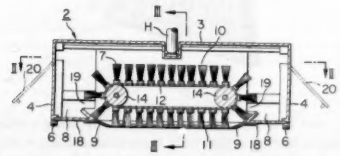
central slab and portions of substantially increased thickness along at least two opposite edges of said slab, said padding surrounding said foamed resilient material and filling the space between the portions and adjacent said slab to form a faired contour around the periphery of said pillow, wherein said portions of increased thickness extend from the planes of the opposite sides of said slab, wherein the said portions extend from said planes a distance of substantially twice the thickness of said slab.

3,924,284
THERMO-CLOUD ELECTRIC MATTRESS
Alvin M. Nelson, 198 W. 15th St., Holland, Mich. 49423
Filed June 17, 1974, Ser. No. 479,645
Int. Cl.² A47C *27/08*
U.S. Cl. 5—347 **1 Claim**



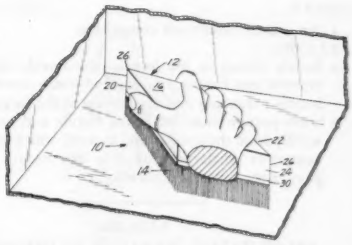
1. An electric bed mattress comprising:
a thermostatically controlled heating element interposed between upper and lower protective pads, fabricated of cotton;
insulating means disposed beneath said lower protective pad;
a relatively thick resilient pad formed of foam rubber positioned above said upper protective pad;
a fabric cover of a material such as rayon-damask fixed about the entire exterior of the mattress assembly;
a relatively thin wool pad interposed between the top surface of said resilient pad and the underside of the top portion of said fabric cover;
said insulating means comprising an insulated paper structure covered with foil on its top side to radiate the heat from said heating element upwardly through the mattress.

3,924,285
FLOOR SWEEPER
Hiroshi Hukuba, Nagareyama, Japan, assignor to Kabushiki Kaisha Hukuba Future Research, Nagareyama, Japan
Filed Jan. 23, 1974, Ser. No. 435,680
Claims priority, application Japan, Jan. 29, 1973, 48-11685
Int. Cl.² A47L *11/22*
U.S. Cl. 15—49 R **14 Claims**



1. A floor sweeper, comprising:
box-shaped hollow housing means having an opening in the bottom thereof;
wheel means rotatably supported on said housing means for movably supporting said housing means on a support surface so that said housing means can be moved along said support surface in a sweeping direction which is substantially perpendicular to the rotational axis of said wheel means;
endless beltlike brush means disposed within said housing means and having a lower reach positioned adjacent said opening for engagement with the support surface, said beltlike brush means being provided with a plurality of bristles which have outer end portions, the outer end portions of the bristles associated with the lower reach projecting outwardly of said opening for engaging the support surface;
means supporting said endless beltlike brush means for rotation within a plane which is substantially perpendicular to said sweeping direction;
driving means interconnected between said wheel means and said brush means for causing rotation of said brush means responsive to rotation of said wheel means;
dust receiver means positioned within said housing means adjacent said brush means for receiving therein the dust swept up by said brush means; and
elongated handle means connected to said housing means and projecting outwardly therefrom for permitting manual displacement of said housing means in said sweeping direction.

3,924,286
CLEANING BRUSH
Douglas E. Miller, Burnsville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Jan. 24, 1974, Ser. No. 436,054
Int. Cl.² A46B *3/04*; **A47L** *13/12*, *13/16*
U.S. Cl. 15—114 **1 Claim**



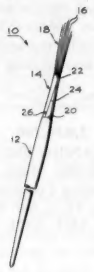
1. A brush including:
a back having opposite first and second parallel major surfaces, opposite first and second side surfaces extending between said major surfaces, and end surfaces joining said major and side surfaces, said back comprising a layer of a stiff resilient polyurethane about one-eighth inch thick defining said second major surface, and a layer of a flexible resilient open cell polyester foam about 1 inch thick adhered to the side of said polyurethane layer opposite said second major surface; and
a multiplicity of generally parallel polypropylene bristles about 0.01 inch in diameter individually embedded in said back and projecting about seven-eighths inch from the second major surface of said back, the bristles being distributed between and to the edges of said second major surface with the distal ends of said bristles defining a common plane having about the same shape and size as the major surfaces;
wherein said major surfaces are rhomboidal in shape, the height of said brush from said common plane to said first major surface is about 2 inches, the width of said back between said side surfaces is about 3 inches, and said side surfaces have a length of about 4½ inches and when one of said side surfaces is oriented north and the other south and the brush is viewed from the first major surface said side and end surfaces are disposed at an included angle of about 60° with said end surfaces at the northeast and southwest corners of the first major surface to form projecting corners of the brush, said brush being peculiarly adapted to fit a right human hand with one of said projecting corners extending between the thumb and index

finger of the hand and having bristles to its edges to provide particular utility for cleaning in corners.

3,924,287
ARTIST'S PAINTBRUSH

Anna P. Brown, Hawthorne, Calif., assignor to Anna P. Brown; Joseph S. Brown, both of Hawthorne and Richard A. R. J. Brown, San Diego, all of, Calif., part interest to each

Filed Aug. 5, 1974, Ser. No. 494,495
Int. Cl.[2] A46B 3/04; A46D 1/00
U.S. Cl. 15—192 **6 Claims**

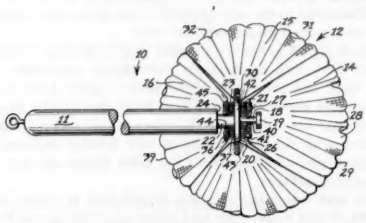


1. An artist's paintbrush comprising:
a handle;
a ferrule joined to the handle, the ferrule being slightly tapered and having a larger end and a smaller end, the handle extending into the ferrule at the larger end; and
a brush portion mounted in the ferrule and extending outwardly from the smaller end thereof, which brush portion comprises bristles of chinchilla hair from a selected region of the tail of a chinchilla.

3,924,288
BRUSH HAVING A HEAD OF GATHERED NET MATERIAL

Dorothy S. Breland, 1209 McCullough Ave., Huntsville, Ala. 35801

Filed Jan. 14, 1975, Ser. No. 541,422
Int. Cl.[2] A47L 17/04
U.S. Cl. 15—225 **4 Claims**

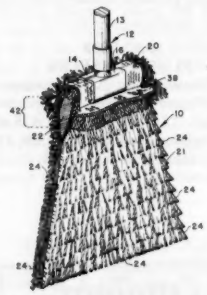


1. A brush device comprising:
a. a handle including an end portion having a longitudinal axis and a free end,
b. said end portion comprising a distal annular groove coaxial of said longitudinal axis and adjacent said free end,
c. an attachment surface extending circumferentially and coaxially of said end portion adjacent the proximal end of said distal groove opposite said free end,
d. a first elongated strip of synthetic, loose-weave, net material, having first and second side edge portions,
e. a first strand sewn the length of and along said first side edge portion of said first strip, gathering said strip at spaced points along said strip, thereby shortening the effective length of said strip and creating an effective thickness normal to the ungathered surface of said strip,
f. said first strip being lap-wound around said end portion of said handle, said first strand being wound circumferentially in said distal groove, and said second side edge portion projecting distally from said attachment surface,
g. means securing said first strip wound around said end portion,
h. a second elongated strip of synthetic, loose-weave, net material, having first and second side edge portions,
i. a second strand sewn along the length of and medially of said first and second side edge portions of said second strip, gathering said second strip at spaced points along said strip, thereby shortening the effective length of said second strip and creating an effective thickness normal to the ungathered surface of said second strip,
j. said second strip being lap-wound around said end portion of said handle, said second strand being wound circumferentially around said attachment surface so that the first side edge portion of said second strip projects distally toward and against said first wound strip, and the second side edge portion of said second strip projects generally in the opposite direction of said first side edge portion of said second strip,
k. second means securing said second strip wound around said attachment surface.

3,924,289
WET MOP HEAD CONSTRUCTION

Ernest Levon Richards, LaGrange, Ga., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Nov. 14, 1974, Ser. No. 523,884
Int. Cl.[2] A47L 13/20
U.S. Cl. 15—229 AC **6 Claims**

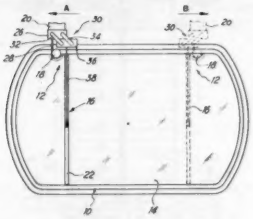


1. In a wet mop head construction comprising a main body of pile fabric having a generally trapezoidal shape with pile on the outer faces thereof and a headband attached to the shorter parallel side of the fabric for engagement by the gripping elements of a mop tool to position the fabric in free-hanging relation from the tool; the improvement wherein said headband comprises a generally rectangular shaped fabric secured in overlying relation about said shorter parallel side edge of the main body pile fabric and having free end portions extending from its points of securement outwardly from opposite faces of the main body fabric adjacent its shorter parallel side to a point beyond the pile of the main body to aid in preventing the gripping elements of a mop tool engaging the headband from contacting a surface to be treated by the mop head construction.

3,924,290
CLEANING DEVICE E.G. FOR VEHICLE HEADLIGHT LENS

Olivier Puyplat, Paris, France, assignor to Cibie Projecteurs, Bobigny, France

Filed Jan. 25, 1974, Ser. No. 436,430
Claims priority, application France, Mar. 2, 1973, 73.07481
Int. Cl.² B60S *1/46*
U.S. Cl. 15—250.04 **2 Claims**

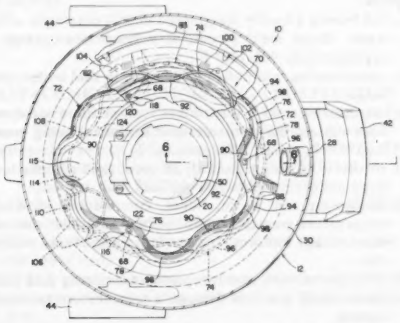


1. A cleaning device for the lens of a headlight, comprising:
a drive element reciprocable translationally in a plane parallel to the plane of the lens,
a nozzle, fixed to and movable with said drive element, for spraying washing liquid on the lens,
a support,
a wiper carried by said support for frictional engagement with the lens,
a pair of parallel links pivotally joining said support to said drive element, and
abutment means defining two extreme positions of said support with respect to said drive element, said nozzle being located between said extreme positions,
whereby during the initial movement of said drive element in either direction said support moves from one of its extreme positions to the other so that said wiper is arranged behind said nozzle with respect to the direction of movement of said drive element.

3,924,291
BLOWER CONNECTION AND EXHAUST VALVE CONFIGURATION FOR A CLEANER OR THE LIKE

Donald B. Tschudy, Canton, and John L. Fawcett, North Canton, both of Ohio, assignors to The Hoover Company, North Canton, Ohio

Filed Sept. 17, 1973, Ser. No. 397,614
Int. Cl.² A47L *9/08*
U.S. Cl. 15—330 **11 Claims**



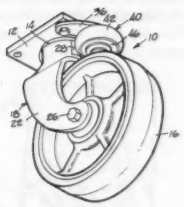
1. An exhaust valve and blower conversion arrangement for use with a floor care appliance having a fan for inducing a flow of discharge air and an apertured housing section having a first aperture therein for providing an exit, at least part of the time, for said discharge air and including;
a. a first relatively flat, laterally extending portion having a first dike transversely extending therefrom,
b. a second relatively flat, laterally extending portion having a second dike transversely extending therefrom, said first and second portions being relatively movable,
c. said second relatively flat, laterally extending portion having a second aperture extending therethrough, and
d. said first and second transversely extending dikes having substantially closed configurations, in plan view, and being undulating in their closed, configured extent whereby, when abutting conformance of said undulations is effected alignment of said first and second apertures is also effected said first and second apertures providing a passageway whereby said blower conversion is effectable.

2. The exhaust valve and blower conversion arrangement of claim **1** wherein;
a. said undulations, upon assuming a non-abutting conformance, permit exit of discharge air therebetween in a substantially unimpeded manner.

3,924,292
ANTI-FLUTTER CASTER

Carl O. Christensen, Alamo, Calif., assignor to Roll-Rite Corporation, Oakland, Calif.

Filed Dec. 9, 1974, Ser. No. 530,745
Int. Cl.² B60B *33/00*
U.S. Cl. 16—35 D **5 Claims**



1. A flutter-resistant caster, comprising:
a. mounting means;
b. caster wheel means including a generally cylindrical shank having a cylindrical portion and being pivotally movable with respect to said mounting means and having at least one surface of lesser curvature than said cylindrical portion formed thereon; and
c. anti-flutter means including biasing means for resiliently engaging said shank in such a manner as to bear alternately against said at least one surface or against said cylindrical portion of said shank, depending upon the pivotal position of said shank with respect to said mounting means.

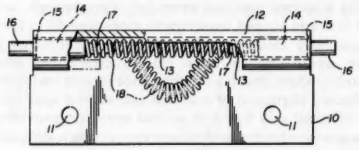
3,924,293
HINGE STRUCTURE

James F. Cain, Youngstown, Ohio, assignor to Marlboro Manufacturing Inc., Alliance, Ohio

Continuation-in-part of Ser. No. 454,013, March 22, 1974.
This application Feb. 12, 1975, Ser. No. 549,312
Int. Cl.² E05D *3/00*
U.S. Cl. 16—169 **3 Claims**

1. A hinge structure for mounting a closure in an opening comprising a mounting frame secured in said opening, an elongated knuckle configuration on said mounting frame, a plurality of cutaway sections in said knuckle configuration, a hinge leaf for each of said cutaway sections, an elongated secondary knuckle on said hinge leaf of substantially the same cross sectional configuration as said first mentioned knuckle configuration, a cut-out section in said secondary knuckle

inwardly of the ends thereof, a pair of pintles movable longitudinally within said secondary knuckle on either side of said cut-out section therein, a spring positioned in said secondary knuckle between said pintles normally urging said pintles outwardly of the ends of said secondary knuckle, at least a portion of said spring being manually movable through and



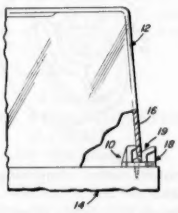
outwardly of said cut-out section of said secondary knuckle and distorted areas in the opposite ends of said secondary knuckle engaging said pintles to hold the same partially within said secondary knuckle and wherein said cut-out section in said secondary knuckle is large enough to permit a major portion of said spring to be moved outwardly of the secondary knuckle therethrough.

3,924,294

HINGE

Arnold Thaler, and Dan Platt, both of Miami, Fla., assignors to Topp Electronics, Inc., Miami, Fla.

Filed June 27, 1974, Ser. No. 483,904
Int. Cl.² E05D *1/06*
U.S. Cl. 16—174 **6 Claims**



1. A hinge, comprising, in combination:
a. a first member; and
b. a second member provided with holder means for receiving the first member and permitting same to pivot with respect to the second member, the second member including a substantially planar base, and the holder means including:
i. first and second spaced, parallel, planar projections extending perpendicularly and codirectionally from the base; and
ii. first and second flanges extending in parallel, codirectional relationship obliquely from the free ends of the first and second projections, respectively, the first flange extending toward the second projection.

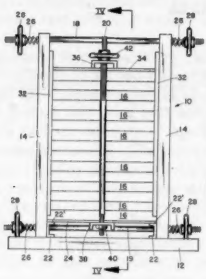
3,924,295

APPARATUS FOR FREEZE FORMING MEAT PRODUCTS

David L. VerBurg, 4069 Lila Ave., Grandville, Mich. 49418

Filed Jan. 9, 1974, Ser. No. 431,678
Int. Cl.² A22C *7/00*
U.S. Cl. 17—32 **12 Claims**

1. A mold for forming a meat product having the shape and appearance of a high priced cut of animal meat and capable of withstanding subsequent cooking without loss of geometric integrity, said mold comprising:
an elongated base having a shaped cavity therein, at least one end of which is open;
a cover, said mold and cover being of a thermally conductive material;
means to detachably secure said cover to said base, said base and cover being constructed to withstand high internal pressures;



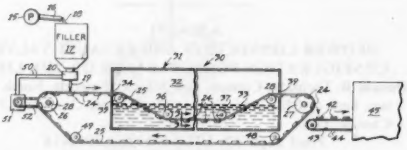
an element slidably closing said open end, said element being movable lengthwise of said cavity; and
resilient means for resistantly holding said element against movement in response to internal pressures generated by expansion of a material contained in said shaped cavity with freezing thereof within said mold, said means permitting movement of said element when internal pressures exceed a predetermined amount.

3,924,296

METHOD OF PREPARING MOLDED MEAT PRODUCTS

James E. Wilkerson, Adairville, Ky., assignor to Odom Sausage Co. Inc. of Kentucky, Adairville, Ky.

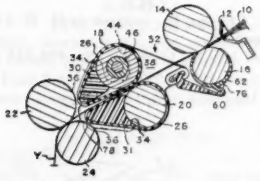
Filed Dec. 9, 1974, Ser. No. 530,839
Int. Cl.² A22B *3/00*
U.S. Cl. 17—45 **10 Claims**



1. A method of preparing a meat product comprising the steps of:
a. hot boning a freshly slaughtered animal carcass to obtain warm, fluent meat pieces, at a temperature range of approximately 90°–100° F.,
b. comminuting said meat pieces while in said temperature range,
c. transferring said warm, fluent, comminuted meat to a filler station, the temperature of said meat being greater than 80° F. at said filler station,
d. relatively moving a plurality of open, rigid receptacles of fixed uniform volume through said filler station,
e. dispensing said warm, fluent, comminuted meat at a temperature greater than 75° F. from said filler station in substantially uniform portions into each of said receptacles,
f. relatively moving said receptacles containing said warm, fluent, meat portions through a temperature processing station,
g. rapidly changing the temperature of said meat portions in said receptacles at said processing station to congeal said meat portions into meat products molded into the shape of said receptacles, and

h. removing said molded meat products from said receptacles.

3,924,297
DRAFTING APPARATUS
Robert M. Ingham, Jr., Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.
Continuation of Ser. No. 809,867, March 24, 1969, abandoned. This application July 11, 1973, Ser. No. 378,091
Int. Cl. D01h *5/88;* **D01g** *31/00*
U.S. Cl. 19—255 **1 Claim**



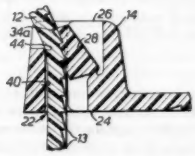
1. A drafting system comprising: a first pair of drafting rolls in nip forming relationship, a second pair of drafting rolls in nip forming relationship spaced from said first pair of rolls, a third pair of drafting rolls in nip forming relationship spaced from said second and first pairs of rolls, an arcuate roving stop means partially encircling one roll of said third pair of rolls, means mounted on one roll of said second pair of rolls having a portion thereof engaging said roving stop means to prevent said roving stop means from rotating with the roll around which it partially encircles and to allow said roving stop means to rotate into the nip of said third pair of rolls upon the detection of a lap build-up on one of said first pair of rolls, said means mounted on one roll of said second pair of rolls including a drafting cradle and a hook member connected thereto which engages said roving stop means, said drafting cradle being rotably mounted on said one roll of said second pair of rolls whereby a lap build-up on one roll of said first pair of rolls will cause said cradle to rotate thereby rotating said hook member out of engagement with said roving stop means to allow said roving stop means to rotate into the nip of said third pair of rolls.

3,924,298
ATTACHMENT AND MOUNTING CONSTRUCTION
Francis Gerard Merser, Framingham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.
Continuation-in-part of Ser. No. 322,712, Jan. 11, 1973. This application Sept. 30, 1974, Ser. No. 510,768
Int. Cl.² B65D *63/00;* **A44B** *21/00*
U.S. Cl. 24—16 PB **10 Claims**

1. An attachment device comprising
a filament having a body member at one end and a bar at the other end,
said body member having a passage therethrough defining an expansive socket through which said filament is passable,
said bar having a length which exceeds that of the passage through said body member and being normally disposed in an orthogonal position relative to said filament,
said device being fabricated of a material which permits said bar to be folded against said filament and has sufficient resiliency that the bar springs back spontaneously into its

orthogonal position after being passed through said passage.

3,924,299
CABLE TIES
Mathew McCormick, Didsbury, England, assignor to Bowthorpe Hellermann Limited, Sussex, England
Filed June 7, 1974, Ser. No. 477,537
Claims priority, application United Kingdom, June 7, 1973, 27290/73
Int. Cl.² B65D *63/00*
U.S. Cl. 24—16 PB **2 Claims**



1. A one piece molded tie of plastics material comprising:
a. a flexible elongate strap;
b. a head at one end of said strap;
c. there being an aperture extending through said head in a direction transverse to the plane of said strap;
d. a pivotally mounted pawl disposed within said aperture;
e. at least one first transverse tooth formed on said pawl;
f. at least one second transverse tooth formed on said pawl;
g. all said first and second teeth having their crests in a common flat plane;
h. a wall on said head defining an abutment surface on one side of said aperture opposite said pawl and parallel to said common plane of pawl teeth crests while the top of said wall defines a surface substantially perpendicular to said abutment surface;
i. a transverse ridge formed by a junction between said abutment surface and said substantially perpendicular surface;
j. the projection of the crest of said at least one first pawl tooth onto the plane of said abutment surface lying, over at least substantially the whole pivotal movement of said pawl, further than said ridge from the projection of the pivot of the pawl onto said abutment surface;

k. the projection of the crest of said at least one second pawl tooth onto the plane of said abutment surface lying closer than said ridge to the projection of the pivot of the pawl onto said abutment surface;

l. said pawl, in the manufactured condition of the tie, being spaced from the plane of said abutment surface;

m. a series of transverse ratchet serrations formed on one side of said strap; and

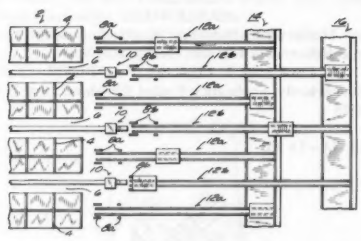
n. said ratchet serrations and pawl teeth being complementarily profiled to cooperate and permit passage of the free end of the strap through said aperture from the pivoted end of said pawl but to prevent subsequent withdrawal of said strap in the opposite direction; and tension applied to said strap in said opposite direction serving to pivot said pawl for said at least one second pawl tooth to firmly grip said strap flat against said abutment surface and said at least one first pawl tooth to bend said strap over said transverse ridge.

3,924,300

SHUTTEL CAR MECHANISM FOR TRANSFERRING LOADS BETWEEN TWO STATIONS

Edwin T. Hilger, and James S. Miller, both of Louisville, Ky., assignors to A-T-O, Inc., Willoughby, Ohio

Division of Ser. No. 232,755, March 8, 1972, Pat. No. 3,746,148. This application June 4, 1973, Ser. No. 366,743
Int. Cl.[2] B65G *1/06*
U.S. Cl. 214—16.4 A **2 Claims**



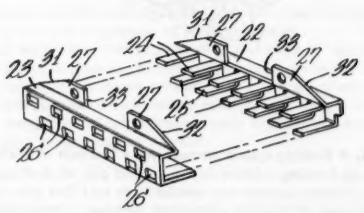
1. In a storage system of the multiple aisle rack type and which includes motorized load carrier devices operating in and along the aisles to effect the movement of incoming articles into the racks from individual of a first series of transfer stations located adjacent the ends of the racks and to also effect the movement of outgoing articles from the racks to individual of a second series of transfer stations located also adjacent the ends of the racks in positions intermediate the first series of transfer stations, a load transfer device operatively associated with each of the transfer stations of the first and second series for initially delivering articles to the first series of transfer stations and for picking up articles from the second series of transfer stations, means for supporting said transfer device for movement in a fixed, lineal travel path which includes a corresponding one of said transfer stations and having a frame portion and a bed portion supported in said frame portion for vertical swing movement between a raised article pick-up positon in the transfer device and a lowered article deposit position therein, a drive means for powering said transfer device along said fixed travel paths and relatively toward and away from said transfer stations, said drive means including a lineal member extending longitudinally of the fixed travel paths of such devices and operatively coupled intermediate its ends to said devices, and means for translating lineal movement of said transfer devices through a predetermined portion of its travel path in a direction toward or away from said transfer stations into vertical swing movement of the bed portion of said devices whereby to automatically effect a selective article pick-up and deposit action at such stations, said means including first and second rotatable shafts carried in the frame portion of each of said devices, a cam follower means keyed to said first shaft, a fixed cam mounted adjacent said transfer stations in the path of travel of said devices and disposed to engage with and cause a predetermined angular displacement of said cam follower means and said first rotatable shaft upon the transfer device moving through said predetermined portion of its travel path, sprocket means keyed to each of said first and second rotatable shafts, linkage means for transmitting rotational movement of the sprocket means keyed to said first shaft to the sprocket means of said second shaft, and radius arm means connected between said second shaft and the bed portion of said load transfer device for translating rotational movement of said second shaft into vertical swing movement of said bed portion.

3,924,301

CONTROL ACTUATOR FOR GEAR BELTS AND THE LIKE

Edward I. Fox, Chicago, Ill., assignor to H. W. Crane Company, Maywood, Ill.

Filed July 15, 1974, Ser. No. 488,293
Int. Cl.[2] F16G *3/02*
U.S. Cl. 24—31 L **1 Claim**



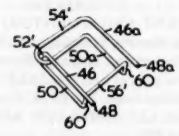
1. A belt connector adapted for application to a belt having transverse alternating ribs and groves, comprising a member shaped to provide fingers adapted to be inserted into grooves of the belt to locate said member at an operative position on the belt, and means for clamping the finger member to the belt to hold the finger member in said operative position, in which the connector member comprises opposed side parts positioned at opposite sides of the belt, and screw means for clamping said side parts to the interposed belt.

3,924,302

STRAP CONNECTOR BUCKLE

Gert P. Somann, Box 34, Algonquin Drive, Huron Park, Ontario, Canada (NOM-1Y0)

Filed July 29, 1974, Ser. No. 492,848
Claims priority, application Canada, Jan. 8, 1974, 189673
Int. Cl.[2] A44B *11/00*
U.S. Cl. 24—74 A **6 Claims**



1. A strap connector buckle formed of a single piece of wire, said connector buckle being approximately rectangular in outline and comprising a first pair and a second pair of strap engaging arms on the first and second opposing marginal sides respectively of the connector buckle, the arms of each pair being approximately parallel to one another and to the arms of the opposing pair and being spaced apart sufficiently to permit, in use, a strap with which the connector buckle is to be used to be passed therebetween, a first arm of each of said

pairs being a terminal portion of the wire and having a free end and the second arm of each pair being an intermediate wire segment, the arms of each pair being further arranged such that both of said first arms are located on one face of the buckle while both of said second arms are located on the opposing face of the buckle, a first generally U-shaped bight of the wire connecting the first arm of the first pair to one end of the second arm of the first pair and a second generally U-shaped bight of the wire connecting the first arm of the second pair to one end of the second arm of the second pair, said first and second U-shaped bights of wire being interlooped together so that they can transmit tension loads whereby to resist any tendency for the second arms of the firsst and second pairs to be spread apart under the influence of strap tension forces thereon, and a further run of the wire connecting the other ends of said second arms together.

3,924,303

LINE GRIPPING PEGS

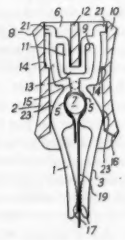
Anthony Elliott, Southwell, England, assignor to Judge International Limited, Brierley Hill, England

Filed Feb. 28, 1974, Ser. No. 446,901

Claims priority, application United Kingdom, Mar. 9, 1973, 11564/73

Int. Cl.² A44B *21/00*

U.S. Cl. 24—137 R **9 Claims**



1. A line gripping peg, comprising:

a peg member having a pair of clamping arms, respective opposed clamping surfaces provided on the clamping arms and a connecting member on opposite ends of which the clamping arms are formed at locations thereon so spaced from said clamping surfaces as to permit resilient relative movement of the opposed clamping surfaces;

a peg housing from one end only of which the clamping arms extend and within which said peg member is permanently retained and is reciprocably movable between a projected position and a retracted position in which said clamping surfaces are disposed entirely within the housing, said housing comprising opposed mutually rigid end walls and parallel opposed side walls extending between the end walls and containing registering slots through which a line can pass when engaged by said clamping surfaces, each slot having a closed end and an open end located at the end of said peg housing from which the clamping arms extend and having a width greater than the diameter of a line to be gripped; and

cooperating surfaces formed on the housing and on at least one of the clamping arms, the cooperating surface on the or each clamping arm having a first part adjacent the clamping surface of the respective arm and substantially inclined relatively to the longitudinal axis of the peg member and a second part extending from said first part, and in the projected position of the peg member located substantially parallel to said longitudinal axis of the peg member, whereby during movement of the peg member from its projected to its retracted position effected with a line disposed between the clamping surfaces, said first part engages the housing thereby to effect relative transverse movement of the clamping surfaces into clamping engagement with the line and thereafter parallel movement of the peg member takes place relatively to the housing without transverse movement of the clamping surfaces, the length of the registering slots being adequate to prevent engagement of the closed ends of the slots with the line during movement to the retracted position of the peg member.

3,924,304

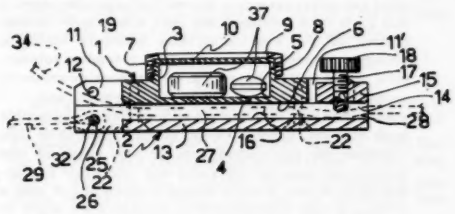
BOX BUCKLE FOR WRIST-WATCH BAND

Joseph L. Grandmont, 6976 deNormanville St., Montreal, Quebec, Canada

Filed Jan. 21, 1975, Ser. No. 542,882

Int. Cl.² A44B *11/06, 21/00*

U.S. Cl. 24—163 K **4 Claims**



1. A combination buckle and receptacle for wrist-watch band comprising a casing part having a pair of spaced lugs projecting from opposite ends thereof, said lugs having pin receiving holes for attaching the ends of an expansion wrist-watch band to said casing part, and a buckle part comprising an elongated plate member having two spaced substantially parallel elongated ridges protruding from one face thereof, means to removably secure said buckle part to the underface of said casing part with said ridges contacting the underface of said casing part, thereby to define an elongated passage between said casing part underface and said plate member, said buckle part having a pair of lugs protruding from one end thereof, each having a pin receiving hole facing each other for fastening thereto the end of a non-expansible wrist-watch band section, a transverse bridge member secured to said ridges at the opposite ends thereof and extending in spaced relation over said plate member to define with said plate member an extension of said passage, and means carried by said bridge member and engageable with a non-expansible wrist-watch half-band section extending within said passage to adjustably lock said last-named half-band section to said buckle part.

3,924,305

WATER-TIGHT FASTENER

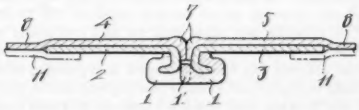
Yoshitaro Hamamura, Otaru, Japan, assignor to Daiichi Rubber Co., Ltd., Japan

Filed Jan. 26, 1973, Ser. No. 326,746

Claims priority, application Japan, June 5, 1972, 47-55760

Int. Cl.² A44B *19/32*

U.S. Cl. 24—205.1 R **9 Claims**



1. A water-impervious fastening assembly for preventing the passage of water therepast, comprising, in combination:

engageable teeth;

cloth tape members connected to selectively engageable teeth, said cloth tape members having their inner side edges bent downwardly and outwardly forming a bent around portion and tightly received within said teeth;

a slider secured to said selectively engageable teeth for movement between a fastener open position and a fastener closed position;

water-impervious members made of a material different than said cloth tape members and substantially impervious to water, each water-impervious member being secured to the exposed surface of an associated one of said cloth tape members, said waterimpervious members having their inner side edges bent entirely around and overlying said bent around portion of said inner side edges of said cloth tape members and also tightly received within said teeth, said water-impervious members having their outer side edges extending beyond the outer side edges of said cloth tape members, the bent downwardly around portion of the water-impervious members having a smoothly rounded thickened portion extending substantially along the entire extent of the bent downwardly around portion of the last-mentioned member; and

wherein, when said slider moves said selectively engageable teeth into said fastener closed position, said cloth tape members are sandwiched between said edges of said water-impervious members and said selectively engageable teeth in said fastener closed position and at least a portion of said waterimpervious members are urged to firmly abut against each other to provide a water-impervious seal therebetween.

3,924,306

LOCK SLIDER

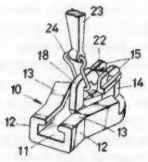
Kiyoshi Oda, Kurobe, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 10, 1974, Ser. No. 531,327

Claims priority, application Japan, Dec. 18, 1973, 48-145326[U]

Int. Cl.² A44B *19/30*

U.S. Cl. 24—205.14 R **2 Claims**



1. In a slider for a concealed slide fastener including a body having a flared front end and a contracted rear end, and a separator positioned centrally at said front end of said body to cooperate therewith to define a substantially Y-shaped guide channel therethrough, a releasable locking mechanism comprising, in combination, a pair of ears projecting upwardly from said separator and extending in the longitudinal direction of said slider substantially in spaced parallelism, a locking pawl arranged longitudinally between said ears of said separator and having a rear end projecting beyond said separator and an upwardly opening recess formed adjacent the front end thereof, a retainer pin supported by and extending transversely between said ears of said separator over said locking pawl, said retainer pin being arranged in registered relationship to said recess in said locking pawl, spring means normally biasing said locking pawl in such a manner that said recess in said locking pawl releasably engages said retainer pin and that said rear end of said locking pawl projects into said guide channel of said body, and a pull tab pivotally connected to said locking pawl and, when exerted with a pull, effective to move said rear end of said locking pawl away from said guide channel of said body against the bias of said spring means.

3,924,307

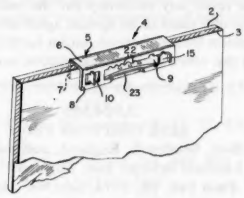
PICTURE FRAMING CLIP

Raymond F. Tate, 21423 Pacific Coast Highway, Malibu, Calif. 90265

Filed Apr. 29, 1974, Ser. No. 465,083

Int. Cl.² A44B *21/00*; G09F *1/12*

U.S. Cl. 24—243 P **9 Claims**



1. A picture framing clip adapted to mount over the edges and secure together a plurality of planar sheets to form a picture frame, said clip comprising:

a. a generally U-shaped channel member having opposing front and rear wall portions, said front wall portion being adapted to engage one side of said plurality of sheets;

b. resilient clamp means slidably mounted on the rear wall portion of said channel member and configured, dimensioned, and positioned to engage the opposite side of said plurality of sheets and to be put into spring-biased relation to said plurality of sheets; and

c. locking means for securing said resilient clamp means in spring-biased relation to the opposite side of said plurality of sheets when the clamp means is slidably displaced to a first position with respect to said channel member and for releasing the clamp means when the resilient clamp means is slidably displaced to a second position with respect to the channel member.

3,924,308

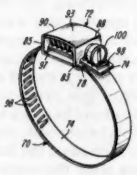
HOSE CLAMP COMPRISING A ONE-PIECE BAND AND HOUSING

Wayne R. Duprez, West Newton, Mass., assignor to Standard-Thomson Corporation, Waltham, Mass.

Filed May 8, 1974, Ser. No. 467,869

Int. Cl.² B65D *63/02*

U.S. Cl. 24—274 R **30 Claims**



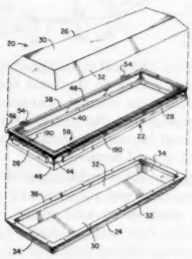
1. A hose clamp comprising a strip of material having a housing portion and an integral band portion, the housing portion having a pair of spaced-apart openings therein providing an opening adjacent each end of the housing, a floor portion integral with the housing portion and extending from one opening through the other opening, a screw having a threaded portion within the housing, the band portion having a series of slots, with a part of the band portion within the

housing and with parts of the threads of the screw within some of the slots, so that rotative movement of the screw causes movement of the threads within the slots and causes movement of the band portion within the housing portion.

3,924,309
BURIAL CASKET

Edward R. Andrus, Jr., Mount Prospect; Dale E. Fahnstrom, Riverside; James G. Hansen, La Grange, and Charles E. Nichols, Chicago, all of Ill., assignors to Elder Wilbert Corporation, Broadview, Ill.

Filed Sept. 14, 1972, Ser. No. 289,175
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] A61G 17/00
U.S. Cl. 27—2 **14 Claims**



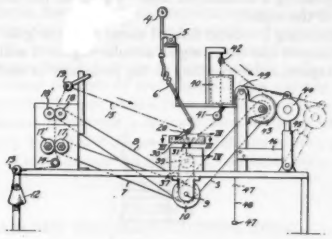
1. A burial casket having a generally rectangular horizontal periphery, said casket comprising a centrally open band member in the shape of the horizontal periphery of the casket, a concavo-convex lower shell member discrete from said band member, means for fastening said lower shell member to the lower edge of said band member, a concavo-convex upper shell member discrete from said band member, and hinge means connecting said upper shell member to the upper edge of said band member, said upper and lower shell members being sugstantially identical in shape, said band member having a substantially uniform cross section throughout its length, said band member cross section having a substantial vertical dimension less than half the vertical dimension of the casket and having a horizontal dimension substantially smaller than the vertical dimension of the band member cross section, and the upper and lower edges of the band member comprising flat, parallel uniplanar edge surfaces, and said upper and lower shell members having similar flat, uniplanar rim surfaces complementary in shape to said upper and lower edges.

3,924,310
STRAND TREATMENT APPARATUS

Robert K. Stanley, Media, Pa., assignor to Textured Yarn Co., Inc., Kennett Square, Pa.

Division of Ser. No. 109,204, Jan. 25, 1971, abandoned, which is a continuation-in-part of Ser. No. 58,917, July 28, 1970, abandoned. This application May 31, 1972, Ser. No. 258,328
Int. Cl.[2] D02G 1/12
U.S. Cl. 28—1.6 **5 Claims**

1. In apparatus for treating textile strands, the improvement comprising a strand-propelling jet device having a bore for passage of textile strand therethrough, having an inlet end for admitting fluid to propel the strand, and having a curved outlet end for both strand and fluid and thereby deviating from a straight-through bore configuration, in combination with a cylindrical chamber for receiving and supporting textile strand, the chamber having a foraminous cylindrical wall and having end walls, one end wall being open centrally along the axis of the cylinder and thereby accommodating the jet device

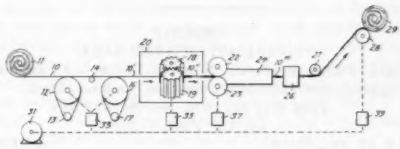


positioned with its outlet end between the end walls and fixed substantially parallel thereto and to the cylindrical wall.

3,924,311
STRAND DRAWING AND CRIMPING TREATMENT

Robert K. Stanley, Media, Pa.

Continuation-in-part of Ser. No. 815,425, April 11, 1969, Pat. No. 3,570,084, and a continuation-in-part of Ser. No. 822,429, May 7, 1969, Pat. No. 3,570,083, and a continuation-in-part of Ser. No. 835,883, June 9, 1969, Pat. No. 3,559,254. This application Sept. 2, 1970, Ser. No. 68,960
Int. Cl. D02g 1/20
U.S. Cl. 28—72.11 **6 Claims**



1. Treatment of drawable textile strands, comprising first drawing a textile strand to increased length, thereafter imparting a regular sawtooth crimp to the drawn strand by gear-crimping it, and then imparting a less regular sawtooth crimp to the strand by compressively crimping it, including the step of heating the strand before the gear-crimping step and maintaining it hot until the compressive crimping step, wherein the strand is maintained at substantially constant temperature from drawing to compressive crimping.

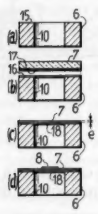
3,924,312
METHOD OF MANUFACTURING AN ELECTROMECHANICAL SYSTEM HAVING A HIGH RESONANCE FREQUENCY

Gerard Coussot, and Eugene Dieulesaint, both of Paris, France, assignors to Thomson-CSF, Paris, France

Division of Ser. No. 352,985, April 20, 1973, abandoned. This application Feb. 26, 1974, Ser. No. 445,900
Claims priority, application France, Apr. 25, 1972, 72.14638
Int. Cl.[2] H01L 41/22
U.S. Cl. 29—25.35 **4 Claims**

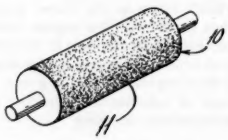
1. A method of manufacturing an electromechanical system having a high resonance frequency, the system comprising at least one wafer of piezoelectric material having at least one pair of electrodes secured to opposite faces of the wafer, said wafer being attached to a rigid substrate at the periphery of a recess therein, said recess overlapping a vibrational zone in the wafer delimited by said electrodes, the method comprising the steps of:

flattening a face of said substrate containing the recess;
depositing a first film of metal on said face;
flattening a face of said wafer;
depositing a conductive layer of gold on the flattened face of the wafer;
depositing a second film of metal onto the gold layer, said second film overlying an annular region of said wafer said region, corresponding to the periphery of said recess;



assembling said substrate and said wafer such that the first and second films contact each other and said annular region overlies the periphery of said recess;
securing together the substrate and the wafer by surface bonding the metals of the first and second films;
reducing by erosion the thickness of the wafer at a face thereof opposite that to which said conductive layer is deposited; and
depositing an electrode on the erosion reduced face of the wafer.

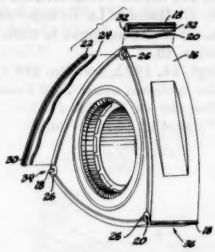
3,924,313
METAL APPLICATOR ROLL
Frank William Broderick, New Providence, N.J., assignor to Standex International Corporation, Andover, Mass.
Filed May 24, 1974, Ser. No. 473,019
Int. Cl.² F16G *11/00*
U.S. Cl. 29—121 R **3 Claims**



1. A hardened metal applicator roll having a precise randomly etched surface for carrying material to be applied to other material, said surface having a random pattern of cells of varying size and depth and irregular shape.

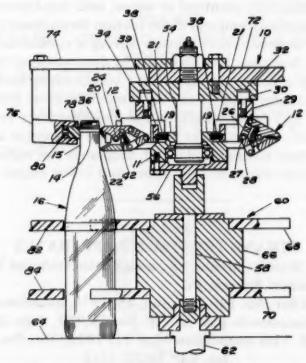
3,924,314
ASSEMBLY METHOD FOR ROTARY ENGINE
Harold W. Ferchland, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Nov. 7, 1973, Ser. No. 413,546
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² B23P *15/00*
U.S. Cl. 29—156.4 R **3 Claims**

1. A method of assembling components of a rotary engine of the type having an outer housing body including a cavity, a rotor disposed in said cavity for relative rotation with said outer body, said rotor having a plurality of grooves with at least one groove containing a spring-biased seal member such that in the operation of said mechanism said seal member is urged into sealing engagement with a surface of said housing body, said method comprising
providing a said rotor, and a said seal member and spring in substantially finished manufactured condition ready for assembly,
applying a film of adherent lubricant composition to a surface of said seal which lies adjacent a wall of a said rotor groove in the operation of said engine,



inserting said spring and seal in said groove and pushing said seal against said spring so that said seal is depressed in said groove below the normal operating position of said seal, said composition adhering to said groove wall and holding said seal in said depressed position while said rotor is placed in said housing,
and then placing said rotor including said spring-biased seal in said housing, said seal subsequently being returned to its operating position by said spring, said composition being removable from said engine by vaporization and combustion during the operation of said engine.

3,924,315
APPARATUS FOR REMOVING PILFERPROOF CLOSURE BANDS FROM RETURNABLE BOTTLES
Edward W. Cady, Richmond, and George R. Parsons, Hagerstown, both of Ind., assignors to Aluminum Company of America, Pittsburgh, Pa.
Filed Mar. 7, 1974, Ser. No. 448,979
Int. Cl.² B23P *19/00*
U.S. Cl. 29—200 D **14 Claims**



9. Apparatus for removing pilferproof closure bands from the necks of returnable bottles comprising:
a rotary table with a plurality of cutter assemblies mounted in it including a pair of pivotable jaws having mating sharp edges for cutting a pilferproof band and mating dull edges for clamping the band to strip it from the container;
means for guiding bottles with pilferproof closure bands on the neck thereof into the apparatus and around the rotary table with the cutter assemblies;

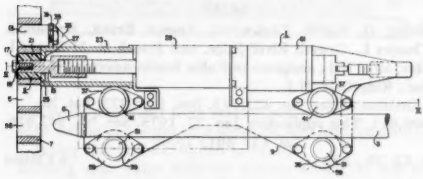
and means for actuating each cutter assembly to sever the pilferproof band on each bottle neck and strip the severed band from the bottle neck as the bottle is guided around the table.

3,924,316

TUBE PUSHING APPARATUS

Thomas D. Matlock, Morton, Pa., and Kenneth R. Smith, Alexandria, La., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 20, 1975, Ser. No. 551,808
Int. Cl.² B23P *15/26*
U.S. Cl. 29—202 R **11 Claims**



1. An apparatus for pushing tubes through holes in a tube sheet of a heat exchanger, said apparatus comprising

a base portion,

a plurality of guide pins which register with holes in the tube sheet to position the base plate relative to a specific hole through which a tube is to be pushed,

at least one idler roller disposed on said base portion,

at least one drive roller disposed on said base portion, said rollers being cooperatively associated to align said tube with said specific hole,

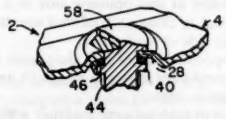
means for driving said drive rollers to push said tube through said specific hole and into said heat exchanger.

3,924,317

METHOD OF COUPLING THE COMPONENTS OF A MOLDING RETAINER

Charles Henry Becker, Braintree, Mass., assignor to TRW Inc., Cleveland, Ohio

Division of Ser. No. 281,697, Aug. 18, 1972, Pat. No. 3,863,300. This application Nov. 7, 1974, Ser. No. 521,823
Int. Cl.² B21D *39/00*; B23P *11/00*
U.S. Cl. 29—509 **2 Claims**



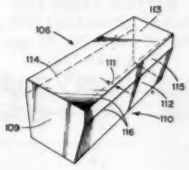
1. A method of joining the molding engaging cross plate and fastener member of a molding retainer combination in an assembly wherein the cross plate and fastener member are non-rotatably coupled to one another comprising the steps of: providing the cross plate with a through opening defined by a polygonal peripheral wall; providing one end of the fastener member with a solid, cylindriform, rivetlike shank extending along a limited axial extent of the length of said fastener member and having a diameter less than the width of said opening in said cross plate; providing said fastener member with a radially protruding shoulder means disposed adjacent the axially inner end of said rivetlike shank and having a width greater than the width of said opening in said cross plate; seating said rivetlike shank generally centrally in said cross plate opening such that said shank protrudes outwardly beyond one side of said cross plate and said shoulder means overlies the other side of said cross plate; displacing material of the protruding end of said rivetlike shank by a process commonly known as orbital heading to cause a portion of the material of said protruding end to flow both radially outwardly and axially inwardly whereby certain portions of said displaced material flow toward said shoulder means and into the space between the outer wall of the remainder of said rivetlike shank and the wall of said cross plate defining said opening therein to nonrotatably lock the fastener member to the cross plate, and other portions of said material flow radially outwardly to overlie the side of said cross plate remote from said shoulder means to provide a fastener member head which, cooperatively with said shoulder means, inhibits relative axial movement of said fastener member and said cross plate.

3,924,318

SAW FOR PRECISION CUTTING TOOL

John W. Baker, 4 Wachusetts Drive, West Acton, Mass. 01720

Division of Ser. No. 273,385, July 20, 1972, Pat. No. 3,820,233. This application Apr. 26, 1974, Ser. No. 464,475
Int. Cl.² B26D *1/28*
U.S. Cl. 29—567 **6 Claims**



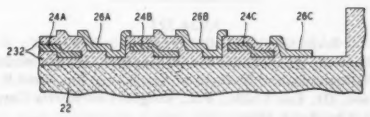
1. In a saw of the type having roughing teeth and finishing teeth arranged to form a cutting edge, each said finishing tooth having a front face, a rear face and side faces and being generally tapered downwardly from near the top to the bottom of said finishing teeth, the improvement wherein, along the top of each said side face of said finishing teeth, there is a relatively narrow band, the narrow bands being vertical and converging from the front face to the back face:

3,924,319

METHOD OF FABRICATING STEPPED ELECTRODES

Amr Mohamed Mohsen, North Plainfield, N.J., assignor to Bell Telephone Labratories, Incorporated, Murray Hill, N.J.

Filed Aug. 12, 1974, Ser. No. 496,697
Int. Cl.² B01J *17/00*
U.S. Cl. 29—578 **13 Claims**



1. A method of forming a solid state device having multiple level electrodes over a substrate comprising the steps of:

forming a first insulating layer disposed on the substrate, the layer having thicker and thinner portions forming a stepped upper surface of a first array of steps,

forming a first conducting layer overlying the first insulating layer,

selectively etching through the first conducting layer and the first insulating layer to form stepped islands of insulating material overlaid by conducting material having upper and lower levels, and laterally centered about the original location of every other step of the first array in the insulating layer,

forming a second insulating layer including forming zones of insulating material on the islands of conducting material and forming stepped zones of insulating material having

a second array of steps each located in the area between successive conducting material islands so lower levels of the stepped zones are adjacent to upper levels of the conducting material islands and upper levels of the stepped zones are adjacent to lower levels of the conducting material islands, and

depositing a conducting material on the stepped zones of insulating material between the conducting material islands.

3,924,320

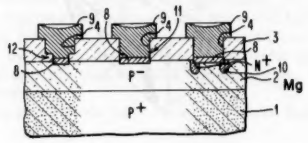
METHOD TO IMPROVE THE REVERSE LEAKAGE CHARACTERISTICS IN METAL SEMICONDUCTOR CONTACTS

Carl Altman, La Grangeville; Sydney G. Chapman, Poughkeepsie, and Akella V. S. Satya, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 244,157, April 14, 1972, abandoned. This application Oct. 18, 1974, Ser. No. 516,236

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—578 **1 Claim**



1. In a method for producing a metal P-type semiconductor contact diode wherein said metal has a work function higher than the electron affinity of the P-type substrate, said method including the following steps:

a. providing a P-type semiconductor substrate having an epitaxial layer thereon and covered by a suitable insulating or oxide film;

b. opening a contact hole through said layer;

c. chemically pre-cleaning the contact area on said substrate;

d. sputter cleaning the contact area on said substrate by subjecting said area to low energy ionic bombardment;

e. depositing metal in said contact hole and in contact with said contact area of said semiconductor substrate, whereby the metal P-type semiconductor diode has an improved reverse current characteristic.

3,924,321

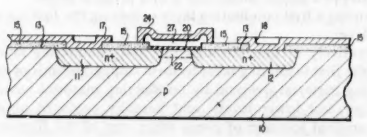
RADIATION HARDENED MIS DEVICES

Koy B. Cook, Jr., Satellite Beach; Jimmy L. Davidson; Joseph D. Gibson, both of Melbourne Beach, and Raymond B. Patterson, III, Eau Gallie,, Fla., assignors to Harris Corporation, Cleveland, Ohio

Division of Ser. No. 92,074, Nov. 23, 1970, abandoned. This application Jan. 30, 1973, Ser. No. 328,033

Int. Cl. B01j *17/00*

U.S. Cl. 29—580 **8 Claims**



1. The process of producing a field-effect device on a silicon body having a flat surface, said process comprising the steps of

forming a thin insulative passivating layer on a portion of said surface of said silicon body,

depositing a layer of spacer material much thicker than said thin passivating layer atop said thin passivating layer,

depositing a metal electrode layer on said spacer material with added support of said metal layer by other than said spacer material and said thin passivating layer;

removing said spacer material to leave a gap between said thin passivating layer and said metal layer, and

evacuating said gap.

3,924,322

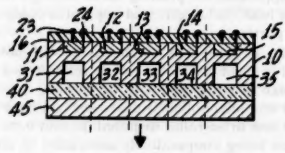
ECONOMICAL PRESSURE TRANSDUCER ASSEMBLIES, METHODS OF FABRICATING AND MOUNTING THE SAME

Anthony D. Kurtz, Englewood; Amnon Brosh, Demarest; Charles L. Gravel, River Edge, and Joseph R. Mallon, Alpine, all of N.J., assignors to Kulite Semiconductor Products, Inc., Ridgefield, N.J.

Division of Ser. No. 423,713, Dec. 11, 1973, Pat. No. 3,900,811. This application Jan. 27, 1975, Ser. No. 542,026

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—580 **6 Claims**



1. A method of fabricating a pressure transducer comprising the steps of:

a. diffusing a plurality of piezoresistive bridge patterns on a given surface of a first wafer of semiconductor material,

b. coating said diffused surface with a layer of semiconductor oxide material,

c. forming apertures in said layer to contact each of said patterns,

d. metalizing said apertures to form a series of metal contact areas on said surface of said layer,

e. forming a series of apertures on the opposite side of said wafer and beneath each of said patterns to define an active diaphragm area,

f. bonding said wafer at said opposite side to a layer of an insulator material to close each of said apertures formed on the opposite side of said wafer,

g. bonding said opposite side of said glass layer to a thicker wafer of semiconductor material to act as an attenuator for said transducer, and

h. separating each of said patterns together with all bonded members to provide a given number of separate pressure transducers structures equal to said plurality.

3,924,323

METHOD OF MAKING A MULTIPLICITY OF MULTIPLE-DEVICE SEMICONDUCTOR CHIPS AND ARTICLE SO PRODUCED

Lewis Herbert Trevail, Indianapolis, and Brian Anthony Hegarty, Martinsville, both of, assignors to RCA Corporation, New York, N.Y.

Division of Ser. No. 355,718, April 30, 1973, abandoned. This application Aug. 23, 1974, Ser. No. 500,164

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—583 **7 Claims**

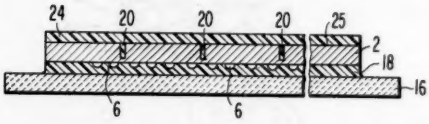
1. A method of fabricating a multiplicity of semiconductor unit chips each of which contains a plurality of substantially completely electrically isolated semiconductor devices, comprising:

forming an array of devices within a single wafer of semiconducting material, each of said devices having one face on which circuit contacts are adapted to be formed and another face opposite thereto,

mounting said wafer on a temporary substrate with said contact face facing said substrate,

forming grooves in said opposite wafer face between some but not all of said devices,

filling said grooves with and coating said opposite surface with, a resin,



removing said wafer from said substrate,

remounting said wafer on a substrate with said opposite face facing said last mentioned substrate,

dividing said wafer between devices which do not have grooves therebetween such that said wafer is divided into said unit chips, and

separating said unit chips with said devices in each unit chip being electrically isolated from one another by the resin in the grooves from the substrate.

3,924,324

METHOD OF MAKING ELECTRET

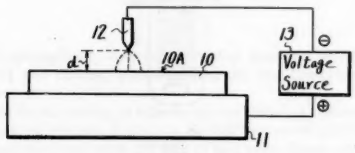
Yoichi Kodera, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed July 2, 1974, Ser. No. 485,112

Claims priority, application Japan, July 5, 1973, 48-76027

Int. Cl.² H01S *4/00*

U.S. Cl. 29—592 **8 Claims**



1. A method of making a mono-charge electret, comprising the steps of charging a dielectric film which is mounted on a metal electrode by subjecting said film to a corona discharge; and then, after said corona discharge is completed and while said film is still mounted on said electrode, heating said charged dielectric film.

3,924,325

METHOD AND APPARATUS FOR MOUNTING TERMINAL PINS FROM A SINGLE SIDE OF A DOUBLE SIDED TERMINAL BOARD

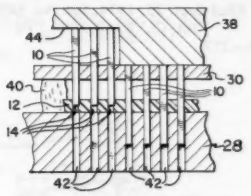
Kenneth L. Kufner, Hickory Hills, Ill., assignor to Molex Incorporated, Lisle, Ill.

Filed July 2, 1974, Ser. No. 485,116

Int. Cl.² H05K *13/04*

U.S. Cl. 29—626 **14 Claims**

1. A terminal pin mounting method comprising the steps of aligning a plurality of terminal pins with holes in a major surface of a circuit member, and simultaneously forcing the terminal pins into said holes to various depths with a stepped platen so that the major portion of some of said terminal pins extends outwardly from said major surface and the major



portion of other ones of said terminal pins extends outwardly from an opposing major surface of said circuit member.

3,924,326

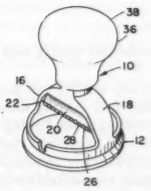
NUT SHELL CUTTER

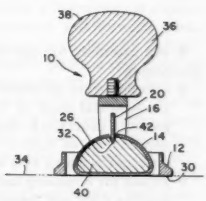
Dante Di Gaetano, 1021 Old Lane St., Drexel Hill, Pa. 19026

Filed Aug. 29, 1974, Ser. No. 501,476

Int. Cl.² A47J *43/26*

U.S. Cl. 30—120.2 **3 Claims**





1. In a nut shell cutter for partially cutting the shell of nut as it rests upon a surface, the combination of

A. positioning means to hold a nut in association with the nut shell cutter,

1. said positioning means comprising a bottom holding ring having a diameter sufficiently large to encompass the nut,

2. the said ring having an annular flat bottom for engaging the surface supporting the nut;

B. a pair of arms rising upwardly from the bottom holding ring and terminating upwardly in a handle receiving junction; and

C. a cutting blade spaced above the bottom of the bottom holding ring a distance less than the thickness of a nut,

1. the said blade being a straight blade and being fixedly connected at each end to a respective arm,

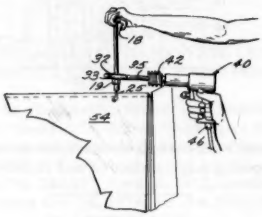
2. the cutting blade having a downwardly directed cutting edge,

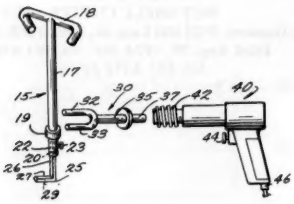
3. the entirety of the cutting edge being spaced from the bottom of the bottom holding ring a distance which is less than the thickness of the nut.

3,924,327
POWERED WINDSHIELD TRACK CUTTER

Jerry Clyde Edwards, Rt. 3, Box 58A, Philadelphia, Miss. 39350

Filed Sept. 25, 1974, Ser. No. 509,347
Int. Cl.² B26B 3/04, 7/00
U.S. Cl. 30—277 7 Claims





1. An assembly for cutting windshield tracks and the like comprising

a. cutting means for simultaneously cutting two portions of a windshield track or the like, said cutting means comprising a generally L-shaped cutting blade having first and second legs of said L sharpened, said legs for cutting different portions of a windshield track simultaneously,

b. means for mounting said cutting means and for providing positive direction therefor, said means including an elongated frame member having a portion thereof for grasping by an operator and an end portion for mounting the first of the legs of said L-shaped blade,

c. power means for supplying a mechanical force to said frame member in a direction substantially perpendicular to the direction of elongation thereof, and

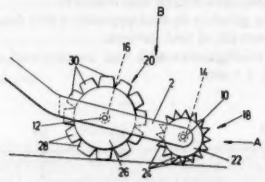
d. means for transferring a mechanical force from said power means to said cutting means through said frame member, said transferring means comprising (i) means for abutting said elongated frame member at a point thereof between the portion thereof for grasping by an operator and the general area of mounting of said cutting means to said frame member, and (ii) means for operatively connecting said force transferring to said power means.

3,924,328
CUTTING TOOL FOR WALLPAPER

Frank Mould, Rowlands Gill, England, assignor to Contexo Limited, Bursiem, England

Filed Jan. 16, 1975, Ser. No. 541,582
Int. Cl.² B26B 3/08
U.S. Cl. 30—307 6 Claims

1. A cutting tool including a body member, first and second wheels mounted on said body member and rotatable in a common plane, a plurality of radial teeth projecting from the periphery of the first wheel, and the periphery of the second wheel comprising at least one cutting element, the arrangement being such that, on pressurised rotation of said wheels over a sheet of material, the teeth of the first wheel perforate said sheet and the at least one cutting element of the second

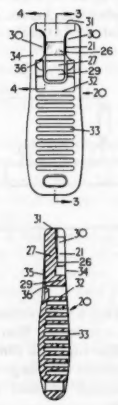


wheel scores along the line of said perforations formed by the first wheel.

3,924,329
HAND TOOL COMPRISING A HANDLE AND REMOVABLE BLADE

Ronald David Carter, Leamington Spa, England, assignor to Stanley Tools Ltd., Sheffield, England

Continuation-in-part of Ser. No. 373,496, June 25, 1973, abandoned. This application Jan. 31, 1975, Ser. No. 546,133
Int. Cl.² B26B 5/00
U.S. Cl. 30—339 5 Claims



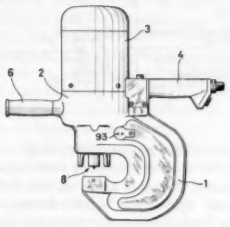
1. A hand tool comprising a handle and a removable blade, the handle being in one piece of moulded material and having firstly a channel extending part-way along the handle from one end thereof to receive the blade and secondly a part which is adapted to interlock positively with the blade so as to retain the blade and which is at least partly resilient so that it can be forced out of interlock with the blade for removal of the blade, the said part of the handle comprising a spigot and a resilient cantilever from which the spigot extends, the blade having a cut-out therein through which the spigot extends, the cantilever extending part-way along the handle from near said one end thereof, where the cantilever is joined to the body of the handle, toward the other end of the handle.

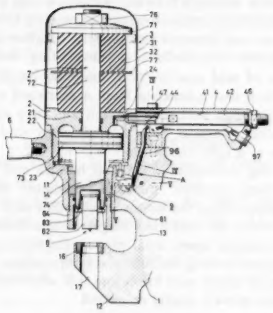
3,924,330

HYDRAULICALLY OPERATED WORKING MACHINE

Shigeru Mitsuhashi; Kyoichi Hirokawa; Noboru Saito; Minoru Kaneko; Michihiro Shoji; Masunari Kowada, and Yasuo Kazama, all of Tokyo, Japan, assignors to Nitto Kohki Co., Ltd., Tokyo, Japan

Filed July 1, 1974, Ser. No. 484,552
Claims priority, application Japan, Aug. 4, 1973, 48-91668
Int. Cl.[2] B26F *1/02, 1/34*
U.S. Cl. 30—362 7 Claims





1. A hydraulically operated working machine usable for punching and cutting operations and the like comprising, in combination:

a main frame having an interior piston chamber reducing to a narrow opening suited for guiding piston reciprocation; a cap mounted upon the side of said main frame opposite said opening and arranged so as to close one end of said piston chamber;

a main operating handle joined to said main frame and aligned transverse to the longitudinal axis of the piston chamber, said handle being provided with an internal conduit for connecting said piston chamber to a supply source of pressured fluid for moving the piston assembly in a first direction;

a piston mechanism comprising a piston member mounted for reciprocal movement within said piston chamber and provided on one side with a first extension which extends in said first direction through said main frame and into said opening;

a work head mounted at the free end of said first extension for reciprocating engagement with the workpiece adjacent said opening, said piston member being further provided with a second extension which extends in a second direction opposite said first direction through said piston chamber and said cap;

a holding member mounted upon the free end of said second extension; and

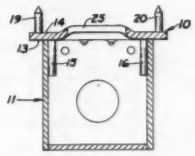
resilient piston retracting means arranged on the exterior side of said cap and positioned between said holding member and said cap for urging said piston mechanism in said second direction.

3,924,331

MARKING TEMPLATE

Richard H. Goosen, 1705 Lake Ave., R.R. No. 1, Holton, Mich. 49425

Filed Dec. 9, 1974, Ser. No. 530,715
Int. Cl.[2] B26F *1/24*
U.S. Cl. 30—366 5 Claims



1. In a device for facilitating accurate cutting of openings in rigid wall covering sheets for access to a conventional electrical outlet box, a plate having rearward and forward faces, locating means projecting from said rearward face for engagement with said outlet box to accurately position said plate on said box, and marking means projecting from said forward face and arranged to make the mark on the rearward face of a wall covering sheet pressed thereagainst, said plate being generally rectangular, said marking means comprising four rigid marking pins and means for securely fastening said marking pins to said plate to project forwardly in parallel relation from four corner portions of said forward face of said plate, said rigid marking pins having sharply pointed ends in a plane parallel to said plate for making marking indentations on the rearward face of a wall covering sheet pressed thereagainst, and said locating means comprising four generally cylindrical rigid locating pins and means for securely fastening said marking pins to said plate to project rearwardly in parallel relation from said rearward face of said plate, said locating pins being arranged to engage inside four corner portions of said outlet box.

3,924,332

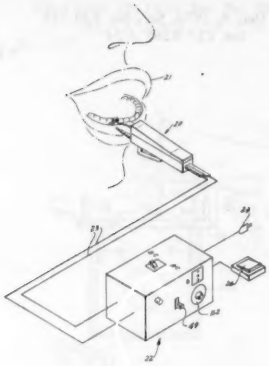
INTRA-ORAL FUSION PROCESS

Marvin A. Rauch, 1223 Cornaga Ave., Far Rockaway, N.Y. 11691; Raymond L. Boni, 369 Barr Ave., Woodmere, N.Y. 11598, and Thomas D. Hadnagy, 17 Briar Lane, Roslyn Heights, N.Y. 11577

Filed Aug. 29, 1973, Ser. No. 392,544
Int. Cl.[2] A61C *7/00*
U.S. Cl. 32—14 R 4 Claims

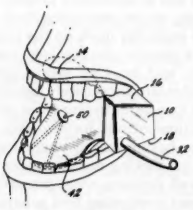
1. An intra-oral process for preventing spaced first and second teeth from moving together in the mouth including the steps of selecting first and second bands each of which has a projecting shelf formed thereon and placing said bands on said first and second teeth respectively with said shelves projecting outwarly from the mouth, selecting a spacer member having a body and extensions thereon and placing said body in the space between said first and second teeth with respective extension thereof on respective shelves of said first and second

bands, fusing the ends of said spacer member to said respective shelves while in the mouth, and thereafter cementing said



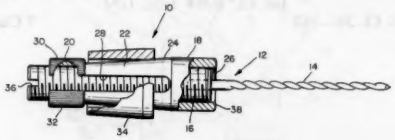
first and second bands respectively to said first and second teeth.

3,924,333
DENTAL APPLIANCE
Norman Erickson, Rte. 3, Box 551, Escondido, Calif. 92025
Filed Sept. 9, 1974, Ser. No. 504,435
Int. Cl.² A61C *17/04*
U.S. Cl. 32—33 **13 Claims**



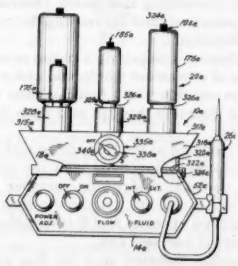
1. A dental appliance for evacuating debris and liquid from the mouth during dental operations, which comprises, a semi-rigid bite block adapted to be gripped by the molars of the patient on one or the other side of the mouth, said bite block deforming upon the initial bite of the patient so as to form a mold thereof for secure placement within the patient's mouth and which bite block resists further deformation permitting the patient to exert substantial pressure on said block, a combination anchoring and evacuating member connected to said bite block and captured within the patient's mouth, said evacuating member and said bite block have formed therein channels for the removal of fluid generated in the forward compartment and said bite block having formed therein channels for the removal of fluid generated in the back compartment, said member bearing against the linqual gingiva, a resilient collector removably connected to said evacuating member which collector extends from the evacuating member through the retro-molar space into the vestibule and rests on tissue overlying the ascending ramus and extends over the palate where it conforms to and lies on maxillary gingiva tissue and conforming to the shape of the mouth and separates the mouth into a forward compartment that is being worked on and a rear compartment, said collector collects fluid and saliva generated during said operation and diverts the same to said evacuating member for removal from the mouth.

3,924,334
ROOT CANAL IMPLEMENT
Frank Nickolis Lentine, Taylor, Mich., and William Francis Keller, Leawood, Kans., assignors to Sybron Corporation, Rochester, N.Y.
Filed June 21, 1974, Ser. No. 481,524
Int. Cl.² A61C *5/02*
U.S. Cl. 32—57 **3 Claims**



1. A root canal instrument comprising:
a. a wire to be used in filing the root canal of a tooth;
b. an externally threaded knob on one end of said wire;
c. a generally cylindrical handle having a threaded bore extending therethrough for receiving said threaded knob with said wire projecting outward from a forward end surface of said handle;
d. said handle having a forward portion, a rear portion and an intermediate portion tapering outwardly from said rear portion to said forward portion, the smaller diameter of said tapered intermediate portion being less than the diameter of said rear portion, and said handle having a longitudinal slot extending from a rearward end surface thereof through said rear portion and into said tapered intermediate portion, said slot allowing said handle to function as a split chuck; and
e. a lock ring positionable on said handle and about said intermediate portion, the inner diameter of said ring being smaller than the diameter of either said forward or rear portions so that said ring will interfere with said tapered surface upon axial movement forward for constricting and locking the rear and intermediate portions of said handle about said knob and will abut said rear portion when moved axially rearward.

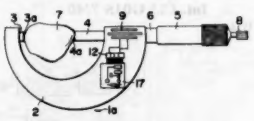
3,924,335
ULTRASONIC DENTAL AND OTHER INSTRUMENT MEANS AND METHODS
Lewis Balamuth, New York; Arthur Kuris, Riverdale, and Manuel Karatjas, Glen Oaks, all of N.Y., assignors to Ultrasonic Systems, Inc., Farmingdale, N.Y.
Continuation-in-part of Ser. No. 119,298, Feb. 26, 1971, Pat. No. 3,809,977. This application Dec. 20, 1971, Ser. No. 209,971
Int. Cl.² A61C *3/06*; A61H *1/00*; H01V *7/00*
U.S. Cl. 32—58 **31 Claims**



1. An ultrasonic dental system including
A. a converter for providing electrical current at an ultrasonic rate,

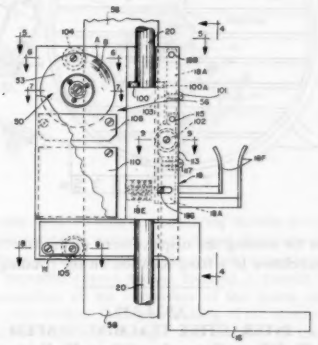
B. an accessory having a tip for use in the oral cavity when ultrasonically vibrated, said accessory including
1. housing means,
2. a transmission member having a rear section and a front section, said front section extending beyond said housing and having said tip secured thereto,
3. transducer means connected to said section for driving said transmission member, and
4. means to suply a fluid to said tip,
C. means electrically connecting said converter to said transducer means in said accessory,
D. fluid regulating means communicating with said accessory means to supply a fluid to said tip,
E. internal fluid supply means including dispensing means adapted to be coupled with a liquid reservoir communicating with said fluid regulating means to provide an internal supply of liquid to the accessory,
F. external fluid supply means communicating with said fluid regulating means to provide an external supply of liquid to the accessory,
G. control means communicating with said fluid regulating means for permitting selection of fluid from said internal fluid supply means or said external fluid supply means,
H. liquid reservoir means adapted to be readily engaged with said dispensing means to permit the utilization of a variety of fluids within the oral hygienic procedures to be conducted with the dental system, and
I. means for flushing said internal supply means with fluid from said external supply means.

3,924,336
MEASURING INSTRUMENT
Kiyoshi Inoue, Tokyo, Japan, assignor to Inque-Japax Research (Ijr) Inc., Yokohamashi, Japan
Filed Mar. 21, 1974, Ser. No. 453,548
Claims priority, application Japan, Mar. 22, 1973, 48-32915
Int. Cl. G01b *3/18*
U.S. Cl. 33—164 R **3 Claims**



1. A measuring instrument comprising:
a frame having a first surface;
a second surface movably mounted in said frame and juxtaposed with said first surface and defining an adjustable gap therewith;
a transducer mounted on said frame and connected to said second surface, said transducer producing an output representing the position of said second surface;
a detector on said frame connected to said transducer for producing an analog signal of said output therefrom;
an amplifier on said frame connected to said detector for amplifying said analog signal;
an analog-to-digital converter on said frame connected to said amplifier for transforming said amplified analog signal into a digital pulse train;
a reversible counter on said frame connected to said analog-to-digital converter for counting the pulses of said pulse train;
a decoder on said frame connected to said reversible counter for generating a display signal; and
an optical display on said frame coupled to said decoder for displaying numerical values corresponding to said display signal and representing the position of said second surface.

3,924,337
HEIGHT GAGE
James L. Taylor, 928 Juanita Ave., LaVerne, Calif. 91750
Continuation-in-part of Ser. No. 313,699, Dec. 11, 1972, abandoned. This application July 17, 1974, Ser. No. 489,176
Int. Cl.² G01B *7/00*
U.S. Cl. 33—169 R **8 Claims**

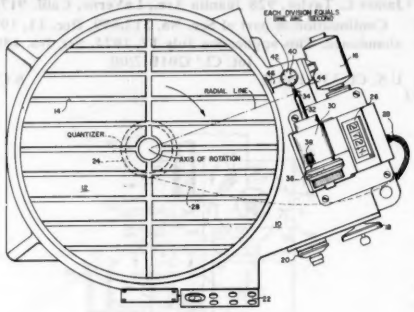


1. A height gage including: a base; an elongated upright guide column of rectangular cross-section mounted on said base; a carriage; first, second and third bearing assemblies rotatably mounted on said carriage to enable said carriage to be movable up and down said column; an upright rod rotatably mounted on said base adjacent to said column; a rotatably mounted fine adjustment knob; means coupling said knob to said rod to cause rotation of said rod upon rotation of said knob; means coupling said carriage to said rod to cause said carriage to move up and down said column as said rod is rotated by rotation of said fine adjustment knob; spring loaded trigger means connected to said last-named coupling means for selectively decoupling said last-named coupling means from said rod to permit said carriage to be freely moved up and down said column; an encoder mounted on said carriage and including a drift shaft engageing the edge of said column in frictional line contact therewith for rotation of said drive shaft as said carriage is moved up and down said column to cause said encoder to generate electric signals, the first and second of said bearing assemblies and said encoder drive shaft engaging opposite edges of said column for supporting the carriage on the column, and the third of said bearing assemblies being spaced from the edge of said column and having guide flanges engaging the column; and an electronic display unit electrically coupled to said encoder.

3,924,338
ROTARY POSITIONING APPARATUS AND METHOD
George F. Kindl, Newington, Conn., assignor to Colt Industries Operating Corporation, West Hartford, Conn.
Filed Apr. 24, 1974, Ser. No. 463,508
Int. Cl.² G01B *5/24*; **B23Q** *17/02, 17/18*
U.S. Cl. 33—174 TC **6 Claims**

6. Apparatus for setting an angular position comprising:
a support;
a rotating member mounted for rotation upon the support;
means for indicating a plurality of discrete angular index positions of the rotating member;
means for providing a fixed reference location on the support which lies along a radial line from the axis of rotation of the rotating member and is adjacent the rotating member;
means for displacing the reference location by an amount which corresponds to the desired angular increment be-

tween two adjacent index positions in a direction perpendicular to the radial line; and



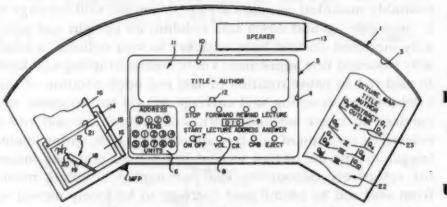
means for sensing the displacement of the reference location relative to a fixed location on the rotating member.

3,924,339

INTERACTIVE TEACHING SYSTEM

Stewart W. Wilson, Concord, and John W. Ericson, Marblehead, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 2, 1972, Ser. No. 294,475
Int. Cl.[2] G09B *7/00*
U.S. Cl. 35—8 R **24 Claims**



1. In an interactive communication system, the combination comprising a lecture tape on which a lecture is recorded, a series of lecture address signals recorded on said lecture tape at locations identifying selected portions of said lecture, an answer tape on which a series of answers to questions that may be raised by said lecture are recorded in spaced sequential locations, a series of answer address signals recorded on said answer tape at locations identifying the beginning of each recorded answer, a tape recorder comprising switching means for selectively reproducing signals recorded on two tapes and adapted to receive said lecture and answer tapes, and means controlled by said address signals and said switching means for moving said answer tape to a location correlated with the position of said lecture tape while said tape recorder is reproducing said lecture.

3,924,340

BLACKJACK TEACHING DEVICE

John M. Tammone, 14282 Utrillo, Irvine, Calif. 92705

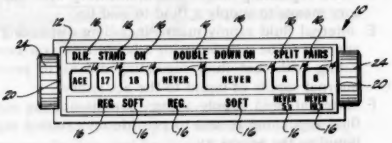
Filed July 26, 1974, Ser. No. 492,051
Int. Cl.[2] G09B *19/22*
U.S. Cl. 35—8 B **2 Claims**

1. A device for teaching the playing of blackjack according to logic which comprises:

a. an outer housing having a plurality of apertures spaced therealong;

b. a plurality of labels on the outer housing, each being associated with an aperture thereon, one aperture being identified by its respective label as relating to the dealer's face card, and each of the other apertures being identified by its respective label or labels with a possible play by a blackjack player; and

c. a data bearing inner member movably positioned within the outer housing, the data thereon being arranged in straight columns, each column being in alignment with an aperture in the outer housing, the column in alignment with the aperture labeled as relating to the dealer's face card containing indicia corresponding to the various possible face cards of the dealer in blackjack, one of such indicia being visible at a time through the aperture, each



of the other columns containing indicia indicating by blackjack point count and the like when a player should make the particular play by which the aperture through which the column is visible is labeled, based upon the indicia corresponding to the dealer's face card showing through the aperture labeled as relating to the dealer's face card,

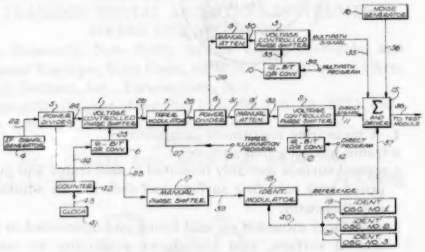
and wherein the apertures other than that labeled as relating to the dealer's face card are grouped in pairs, each pair having a main label for the pair and sublabels for each of the individual apertures in the pair.

3,924,341

DOPPLER MICROWAVE LANDING SYSTEM SIGNAL SIMULATOR

Henry Edelsonn, Woodland Hills, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed June 17, 1974, Ser. No. 480,006
Int. Cl.[2] G01S *7/40*
U.S. Cl. 35—10.4 **10 Claims**



1. A device for simulating the signal from a Doppler type, commutated antenna array ground beacon as received at a predetermined remote receiving point, comprising:

a signal source operating at a predetermined radio frequency;

digital clock means for producing a continuous succession of timing pulses;

a first controllable radio frequency phase shifter responsive to said signal source and having a control input;

first means including a digital counter and a first D/A converter responsive to said counter, said counter being responsive to said clock means, to generate and apply to said first controllable phase shifter control input, a periodic sawtooth signal, thereby to produce a radio frequency sideband spaced a predetermined amount in frequency from said signal source;

second and third controllable radio frequency phase shifters each responsive to said sideband at the output of said first controllable phase shifter, and each having a control input;

programmer means for generating and applying to said second and third controllable phase shifter control inputs, signals representative of phase shift programs corresponding to the direct and multipath signal phase variations during commutation of a ground beacon antenna simulated, respectively;

and a summer circuit responsive to the outputs of said second and third controlled phase shifters and to said signal source to produce a composite signal including said direct and multipath signals and a reference signal, respectively.

3,924,342

GROUND-BASED FLIGHT SIMULATORS

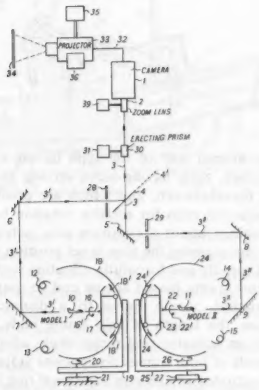
Roy Pedlar, Lindfield, and Brian Malcolm Boustred, Hookwood, nr. Horley, both of England, assignors to Redifon Limited, London, England

Filed Apr. 19, 1974, Ser. No. 462,524

Claims priority, application United Kingdom, May 23, 1973, 24713/73

Int. Cl.² G09B *9/08*

U.S. Cl. 35—12 N **12 Claims**



1. For use in a ground-based flight simulator for simulating flight of a first craft, apparatus for producing an image of a second craft comprising first and second model means of said second craft, the first model means for providing a generally rear view and the second model means for providing a generally front view of said second craft, both model means being correspondingly movable according to the desired aspect angle of the second craft from the first craft, camera means and means for enabling the said camera means selectively to view alternately the first and the second of the two said model means.

3,924,343

EXPANSIBLE DEVICE FOR STRETCHING MATERIAL AND METHOD

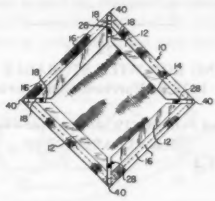
Robert C. Johnson, Pittsburgh, Pa., assignor to Metalogic, Inc., Chagrin Falls, Ohio

Filed Nov. 7, 1974, Ser. No. 521,589

Int. Cl.² D06C *3/08*

U.S. Cl. 38—102.1 **9 Claims**

1. A frame for stretching material secured thereto, said frame comprising elongated defining frame elements movable relative to one another, and rotatable means coacting between adjacent of said frame elements coupling the latter together, predetermined adjustment of said rotatable means causing expansion of said frame, for causing stretching of the material, and wherein said frame elements have mitered end faces adapted for juxtapositioning with the confronting mitered face of an adjacent element, each of said frame elements having an aperture therethrough disposed substantially at right angles to



the respective mitered face and receiving therein in rotatable relation said rotatable means, each of said elements comprising a slot therein at the distal end thereof and receiving therein relatively movable corner means forming a corner for the frame irrespective of the expansion of the frame elements relative to one another during stretching of the material, said corner means imparting strength and stability to the frame regardless of the degree of expansion and retraction and the frame elements relative to one another.

3,924,344

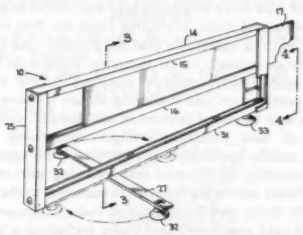
EMERGENCY SIGN DEVICE

Charles H. Davis, 302 Rollins Ave., Dothan, Ala. 36301

Filed Aug. 13, 1974, Ser. No. 497,110

Int. Cl.² G09F *21/04*

U.S. Cl. 40—129 C **1 Claim**



1. A device capable of being mounted on a horizontal surface of a motor vehicle for exhibiting emergency signs, comprising a flat and elongated upstanding support member for the signs, said support member including at least one pair of elongated open channels facing inwardly toward one another along which the signs may be slid into place, said member further including an imperforate end plate at one end thereof extending across said channels, said member also including an end plate at the opposite end thereof extending across said channels and covering an end of a lower one of said channels for preventing the signs from inadvertently sliding outwardly of said channels, said opposite end plate having an opening therein through which the signs may be inserted, said member further including an elongated screw trough disposed along a lower edge thereof, and an elongated leg member mounted between its opposite ends to said lower edge for pivotal movement about an axis perpendicular thereto by means of a threaded fastener extending through said leg member and threadedly engaging said screw trough, said leg member being pivotable between a position of non-use lying in the plane of said support member and a position of use extending outwardly of opposite sides of said support member, said leg

member having a length not greater than the length of said support member, and said fastener being so disposed relative to said leg member opposite ends and relative to said ends of said support member as to permit said leg member to be pivoted into its position of non-use without extending outwardly of said end plates of said support member, and suction cups being mounted to said support member at said lower edge thereof and to said leg member at said opposite ends thereof.

3,924,345

FISHING ROD WITH STORABLE STAKE

Maurice Sapp, 1425 S. Harrison Road, Grand Island, Nebr. 68801

Filed Feb. 20, 1974, Ser. No. 444,253
Int. Cl.² A01K 97/10
U.S. Cl. 43—21.2 **1 Claim**

1. A fishing rod with a storable rod stake formed and arranged to constitute a continuation of the rod handle, comprising a fishing rod having a rod section and an elongate handle, said handle being coupled to said rod section at one end and having a free end, a hollow bore formed in said handle and extending from said free end toward said one end, a one-piece unit comprising an elongate rod stake having a pointed end and a base end and mounting means coupled to said base end and formed with axially opposite coupling means for detachable coupling with the free end of said elongate handle, such that said mounting means can be coupled to the free end of said handle to constitute an integral part of the handle with said stake extending into and stored in said hollow bore, or with said stake extending from the free end of said handle so as to be insertable into the ground, said free end of said handle including a screw threaded portion on its periphery, and said axially opposite coupling means comprising threaded portions on said mounting means for screw engagement with said threaded portion of said handle, said threaded portions of said mounting means comprising interiorly threaded, axially opposite bores opening from opposite ends of said mounting means, said stake passing into one of said threaded bores and being fixed at its base end to the inner end of said one bore, but being spaced radially inwardly of the threads of said one bore, said stake including a pivot joint between its pointed end and said mounting means to permit selective pivoting of the pointed end to a desired angle relative to the stake portion on the other side of said pivot joint so as to permit ready variation of the angle between the pointed end portion and the stake portion on the other side of said pivot joint, and hence between the pointed end portion and the fishing rod.

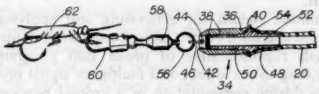
3,924,346

FISHING EQUIPMENT

Albert Leo Evers, St. Louis, Mo., assignor to Frank Apostol, East St. Louis, Ill.

Filed July 29, 1974, Ser. No. 492,427
Int. Cl.² A01K 85/06, 91/00
U.S. Cl. 43—26.2 **10 Claims**

1. Fishing equipment which comprises an elongated, flexible, tubular line which can be cast or thrown onto the surface of a body of water, an air-moving device which is connected to one end of said line to permit fluid to be moved within and relative to said line, said air-moving device being manipulable to enable jets of fluid to be ejected from the other end of said line, said air-moving device being manipulable to cause fluid to move inwardly relative to and also to move outwardly relative to said other end of said line, said air-moving device being manipulable to draw water into said other end of said



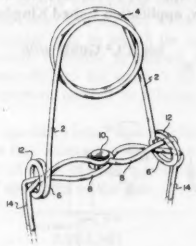
line, and said air-moving device being manipulable to eject jets of water from said other end of said line.

3,924,347

ACTUATOR FOR ANIMAL TRAP

Frank R. Conibear, 2170 Evergreen Place, Victoria, British Columbia, Canada

Filed Aug. 16, 1974, Ser. No. 498,239
Int. Cl.² A01M 23/26
U.S. Cl. 43—90 **8 Claims**



1. In an animal trap of the type having similar first and second frames, each having sides serving as jaws and ends extending therebetween, and which are pivotally connected through adjacent ends for relative rotation between set and closed positions about a common axis, a trigger means for releasably maintaining the trap in set position and an actuator capable of rapidly and forcefully effecting such rotation, having two arms spring biased at one end so that the other end, if unobstructed, would move to a distance substantially greater than the length of said frame ends, each arm terminatng in an actuator ring respectively adapted to encircle adjacent ends of both frames on opposite sides of said axis, an improved actuator wherein an additional ring is fixed along an edge of each of the actuator rings of the actuator to form effectively thicker ring structures at the arm ends whereby when the actuator is expanded onthe closed trap, the outer ones of the actuator rings and additional rings on the arms abut against the inner sides of the jaws of the trap to prevent the actuator rings from sliding over the corners of the frames onto the jaws of the trap.

3,924,348

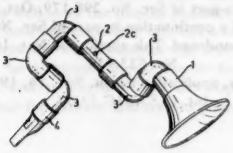
MUSICAL TOY WITH REARRANGEABLE PARTS

Christine Taylor, London, and David William Chisnall, Lingfield, both of England, assignors to Hilary Page "Sensible" Toys Limited, Kenley, England

Filed Aug. 6, 1974, Ser. No. 495,236
Int. Cl.² A63H 5/00
U.S. Cl. 46—17 **1 Claim**

1. A child's musical toy comprising a blow-into sound-producing mouthpiece component, a trumpet end component and a resonance tube assembly detachably connecting said mouthpiece component and end component, said assembly including at least one straight tube component and at least two elbow components, means for serially detachably connecting all said components, said means comprising spigot and socket connections at the ends thereof, said mouthpiece component

having a said socket, said trumpet end component having a said spigot, and assembly components each having a said



socket and spigot at respective ends, each said spigots being adapted to mate with any of said sockets.

3,924,349

TOY VEHICLE KIT HAVING LOCKING PIN THROUGH ENGINE, CHASSIS AND PAN

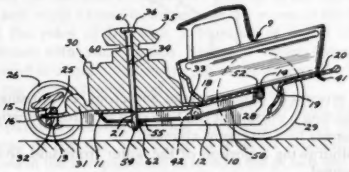
Vernon R. Wamsley, Wayzata, and Gerald A. Cuhel, Glencoe, both of Minn., assignors to Tonka Corporation, Minneapolis, Minn.

Filed Nov. 22, 1972, Ser. No. 308,661

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² A63H *17/00*

U.S. Cl. 46—17 **1 Claim**



1. In a toy vehicle kit comprising various components adapted to be selectively assembled and disassembled,

a. a chassis having transversely extending front and rear recesses for receiving front and rear axles, one of said recesses opening upwardly and one opening downwardly with respect to said chassis,

b. front and rear wheel carrying axles adapted to be seated in said recesses,

c. an engine adapted to be seated on the chassis upwardly thereof and including means to lock the front axle in said front recess,

d. a body adapted to be seated on the chassis upwardly thereof adjacent said engine and including means to lock the rear axle in said rear recess,

e. a pan adapted to extend along the underside of the chassis and lock the body to the chassis, and

f. means coacting with said pan for locking the engine and pan to the chassis including a pin for extending through the engine, chassis, and pan and being rotatable between locking and unlocking positions.

3,924,350

CARTESIAN TOY

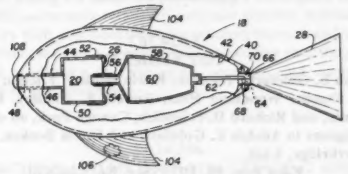
John P. T. Hsu, 8 Park Drive, Old Bethpage, N.Y. 11714

Continuation-in-part of Ser. No. 360,119, May 14, 1973, abandoned. This application Aug. 5, 1974, Ser. No. 494,401

Int. Cl.² A63H *23/08, 23/14*

U.S. Cl. 46—92 **1 Claim**

1. A Cartesian toy including, in combination, a main incompressible fluid-filled container, at least one toy object swimmingly disposed in said main container having an internal air chamber, a flexible member in covering relation over said toy object air chamber, a pump operatively connected to said main container so as to alter the air pressure and volume of said air chamber by transmitting pressure through said incompressible fluid to said flexible member, and improved means for propelling said toy object through swimming maneuvers in said volume of fluid within said main container comprising a pivotally movable fin operatively arranged in propelling relation on said toy object, a drive member operatively connected to transmit flexuring in said flexible member so as to cause pivotal movements in said fin, means at an interposed location between said flexible member and said fin bounding an additional air chamber in communication with said toy object air



chamber which contributes to the floatability and maneuverability of said toy object within the fluid volume of said main container, and control means on said pump including flexible walls bounding an internal chamber for said pump and each having a hand grip to facilitate the movement of said walls toward and away from each other for controlling the extent and rate of pressure and volume change of said toy object air chamber, whereby movements corresponding in said extent and rate to that of said pressure and volume change are also exhibited in said fin to thereby contribute to achieving said swimming maneuvers in said toy object.

3,924,351

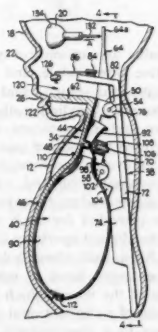
KISSING DOLL HAVING AIR ACTUATED SOUNDER WHICH SOUNDS AFTER BUILDING PREDETERMINED PRESSURE

Rouben T. Terzian, Chicago, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Dec. 20, 1973, Ser. No. 426,439

Int. Cl.² A63H *3/31*

U.S. Cl. 46—118 **8 Claims**



1. In a doll including a torso and a head mounted thereon and sound producing means mounted in said torso for simulating the sound of a kiss, the improvement in said sound producing means comprising:

bellows means for receiving and expelling air, said bellows means including a resilient squeezable body portion connected to a closeable, flexible neck portion defining a passageway between the interior and exterior of said body portion, whereby the air in said body portion is pressurized when said body portion is squeezed and said neck portion is closed; and

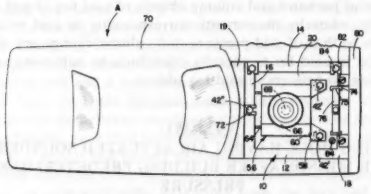
stop cock means associated with the neck portion and the body portion, said stop cock means being movable from a normally closed position closing said neck portion to an open position allowing opening of said neck portion in response to and after continued squeezing of the body portion, whereby pressurized air is expelled from said bellows means when said stop cock means moves from its closed to its open position producing a simulated kissing sound after a predetermined pressure is built up in said body portion.

3,924,352

TOY VEHICLE

Adolph E. Goldfarb, Tarzana; Erwin Benkoe, Encino; Delmar K. Everitt, Woodland Hills; Ronald F. Chesley, La Crescenta, and Richard D. Frierdich, Canoga Park, all of Calif., assignors to Adolph E. Goldfarb and Erwin Benkoe, both of Northridge, Calif.

Filed Feb. 10, 1975, Ser. No. 548,830
Int. Cl.[2] A63H *11/10*
U.S. Cl. 46—202 **12 Claims**



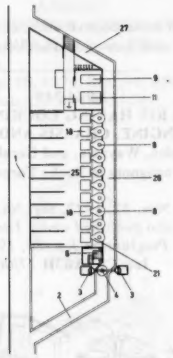
1. A disassemblable toy automotive type vehicle set including a toy automotive type vehicle, and a powered wrenching means operable with said vehicle, said vehicle comprising a frame means, a plurality of cylindrically shaped hubs extending outwardly from said frame means, a cylindrically shaped vehicle wheel provided for each of said hubs and each wheel being sized to be removably and rotatably disposed over each associated hub, each said hub and wheel having apertures capable of being aligned when the wheel is disposed on the hub, a wheel bolt provided for each wheel and capable of being inserted in the aligned apertures for securing the wheels to the associated hubs, said wheel bolts each having an enlarged head, the enlarged head of said bolts having a size relative to the size of the wheel which is at least three times greater than the size of a conventional automobile wheel bolt or lug with respect to a conventional automobile wheel, a drive train component also mountable on said frame means, said drive train component having at least one tab and said tab and frame means having apertures capable of being aligned, a drive component bolt capable of being inserted into said last named aligned apertures to removably secure said component to said frame means, said drive component bolt also having an enlarged bolt head and being of substantially the same size and shape as the wheel bolt, said wrenching means comprising a portable power means, and engageable means sized and shaped to conform to the bolt heads to engage the bolt heads and remove the bolts from the apertures upon actuation of the source of power.

3,924,353

METHOD AND APPARATUS FOR ENRICHING IRRIGATION WATER

Jorge Galvez Figari, Capitan Haya, 3 - 5, Madrid, Spain

Continuation-in-part of Ser. No. 298,179, Oct. 16, 1972, abandoned, and a continuation-in-part of Ser. No. 298,180, Oct. 16, 1972, abandoned. This application Nov. 14, 1974, Ser. No. 523,939
Claims priority, application Spain, Nov. 18, 1971, 397151
Int. Cl.[2] A01C *23/04*
U.S. Cl. 47—1 **7 Claims**



6. A process of irrigating land and crops, comprising:
a. diverting a portion of the flow of water from an irrigation channel to a divergent channel,
b. withdrawing a portion of the water from said divergent channel,
c. charging said withdrawn portion with vegetable resins,
d. introducing pressure-injected air into said withdrawn portion to cause bubbles in at least a portion of said vegetable resins,
e. introducing nutrients to said bubbles which adhere thereon, forming a fertilizer carrier, and
f. returning said carrier to irrigation waters to irrigate land.

3,924,354

SHIPPING AND DISPLAY CARTON FOR CUT FLOWERS

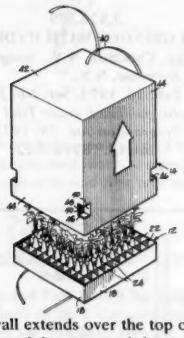
Gerald L. Gregoire, San Rafael, Calif., assignor to Gregoire Flowers, Inc., San Francisco, Calif.

Filed July 30, 1974, Ser. No. 493,037
Int. Cl.[2] B65D *85/50*
U.S. Cl. 47—34.11 **5 Claims**

1. A shipping and display carton for shipping and displaying in a vertically upright condition a plurality of separate, prebunched, cut flower bunches of the kind in which each bunch has a liquid containing pouch tied around the lower stem end of the bunch, said shipping and display carton comprising,
an internally compartmented tray for holding separate flower bunches upright in compartments in the tray,
said tray being rectangularly shaped with a bottom wall and four side walls,
a rectangular shaped base and enclosure unit for positioning the tray at a desired height in the display position of the unit,
said base and enclosure unit having four side walls dimensioned to fit closely over the sides of the tray, an end wall closing one end of the unit and an open end at the other end of the unit,
tray retainer means for holding the tray in a fixed vertical position in the upper part of the unit in said display position, said tray retainer means including tray supports which

project inwardly from the side walls and engage the bottom wall of the tray in said display position and are so located in the side walls as to engage the top edge of the tray in the shipping position to thereby retain the tray in a fixed position within the base and enclosure unit in the shipping position as well as in the display position,

wherein the base and enclosure unit has a vertical height and an open interior which enables the unit to form the top enclosure for a shipping carton for the cut flower bunches when the unit is inverted from the display position and slipped over the flowers and tray to a shipping position in



which the end wall extends over the top of the flowers and the side walls extend down around the stems of the flowers and the sides of the tray, a plurality of liquid retaining pouches with each pouch having a liquid therein and adapted to contain the lower ends of the stems of an individual cut flower bunch, and

said tray having a plurality of internal compartments with each compartment having internal dimensions and a shape so related to the size and shape of a liquid retaining pouch placed in the compartment as to hold the pouch and related cut flower bunch vertically upright during both the shipping and display modes of operation of the carton.

3,924,355

INTERNAL GRINDER

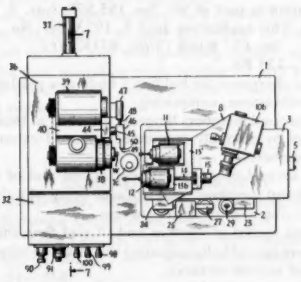
Youji Tatsumi, 1-18, 1-chome, Higashinakayama-cho, Funabashi, Chiba; Shohei Ito, 6-19, 2-chome, Sekibara-cho, Adachiku, Tokyo, and Katsutoshi Ishii, 11-1, 3-chome, Kounodai,, Ichikawa, Chiba, all of Japan

Filed Jan. 19, 1973, Ser. No. 325,102

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] B24B *5/06*

U.S. Cl. 51—3 **5 Claims**



1. A grinding machine comprising, support means, a first grinding wheel head table mounted movably on said support means, a second grinding wheel head table transported on said first grinding wheel table and mounted for oblique movement relative to a direction of travel of the first grinding wheel head table, means mounting a plurality of driven grinding wheel spindles for driving a plurality of grinders for grinding a workpiece, a feed-in table mounted movably on said support means for movement relative to said first grinding wheel head table to feed in operation a workpiece to the grinders individually, a shift table mounted on said feed-in table for movement therewith and relative thereto, means mounting a workpiece-holding means for supporting a workpiece thereon, and means for moving said tables individually and including means moving them jointly for relatively positioning a work-piece on said shift table accurately relatively with said grinders individually in registry with said workpiece for grinding thereon and means to relatively feed at a progressively decreasing rate the grinders and workpiece for executing accurate and controlled grinding of the workpiece.

3,924,356

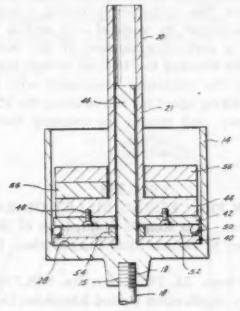
MACHINE AND METHOD FOR GRINDING AND POLISHING BEADS AND MARBLES

George B. Kitchel, 5514 Tupper Lake, Houston, Tex. 77027

Filed Dec. 9, 1974, Ser. No. 530,740

Int. Cl.[2] B24B *5/18, 1/00*

U.S. Cl. 51—7 **14 Claims**



1. A machine for grinding balls comprising:

bowl means for containing the balls having a bottom surface and being adaptable for rotation;

a guideshaft concentrically disposed on said bottom surface of said bowl means;

a non-rotating member slidably engaging said guideshaft, said guideshaft aligning said non-rotating member within said bowl means; and

said non-rotating member having a non-rotating surface oppositely disposed to said bottom surface, said non-rotating surface being perpendicular to the axis of rotation of said bowl means.

12. A method for grinding balls comprising:

insertion of pre-formed roughly spherical balls into a pot adapted for rotation:

adding a slurry of grinding grit and water to the balls;

placing an upper wear plate disposed opposite the bottom of the pot and on a guideshaft concentrically disposed from the bottom of the pot;

grinding the balls by rotating the pot while preventing the upper wear plate from rotating; and

maintaining the balls and the slurry at the periphery of the pot by placing a centrifugal force created by the rotation of the pot on both the balls and the slurry causing them to collect at the periphery of the pot.

3,924,357

DEVICE FOR DEBURRING WORK PIECES

Jürgen Schmidt, Herborn, and Jürgen Hesse, Dusseldorf, both of Germany, assignors to Messer Griesheim G.m.b.H., Germany

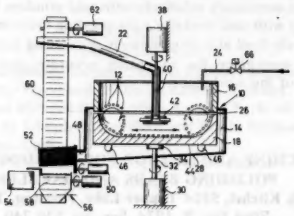
Filed Dec. 4, 1972, Ser. No. 311,910

Claims priority, application Germany, Dec. 2, 1971, 2159838

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] B24C *3/30*

U.S. Cl. 51—13 **4 Claims**



1. A device for deburring work pieces of rubber or similar material comprising an essentially closed container for receiving the work pieces, supplies of a low-temperature medium and a blasting agent and conduit means for introducing them into the container, the container including a bottom trough section rotatable about its vertical axis and a fixed upper section forming a vertical extension of the bottom trough section, means for rotating the bottom trough section, a centrifugal wheel in the container associated with the conduit means for the blasting agent for introducing the blasting agent into the container, and means for rotating the centrifugal wheel.

3,924,358

MACHINE FOR PROCESSING BILLET OR BAR STOCK

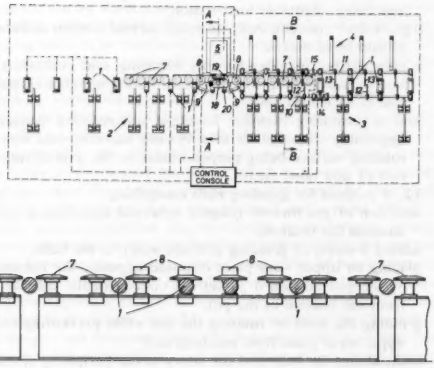
Robert Crownshaw, and Ronald Jubb, both of Sheffield, England, assignors to British Steel Corporation, London, England

Filed Sept. 24, 1974, Ser. No. 508,730

Claims priority, application United Kingdom, Oct. 17, 1973, 48349/73

Int. Cl.[2] B24B *7/12, 49/00*

U.S. Cl. 51—34 C **9 Claims**



1. A machine for processing billet or bar stock, comprising;

a machine head,

a roller mechanism including a plurality of driven, horizontally disposed table rollers for driving said stock into and out of engagement with the head, and

co-operating sets of rolls on each side of the head for laterally gripping the stock, at least one roll in each set and a plurality of other rolls in the roller mechanism aligned therewith having surfaces inclined to the horizontal plane to provide edge support for the stock on its leading and trailing ends in dependence on the stock shape, and

control means for controlling both the rate of drive of the stock along the roller mechanism and the operation of the machine head.

3,924,359

CENTERLESS GRINDER WITH HYDRAULIC DRIVE

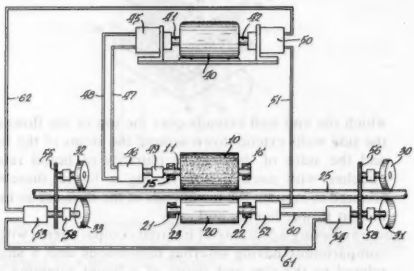
Robert L. Schaller, Camilius, N.Y., assignor to Sundstrand Syracuse, Inc., Syracuse, N.Y.

Filed Feb. 16, 1973, Ser. No. 332,811

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] B24B *5/22*

U.S. Cl. 51—103 TF **7 Claims**



1. In a centerless grinder, a grinding wheel and a coacting regulating wheel, a first hydrostatic transmission for driving said grinding wheel, a second hydrostatic transmission for driving the regulating wheel, each of said transmissions including a pump and a motor, and a main motor having output shaft means connected to the pumps of both of said hydrostatic transmissions whereby the regulating wheel functions to assist said main motor when the regulating wheel is functioning as a brake.

3,924,360

KNIFE SHARPENER

Paul C. Haile, 3441 Ruffin Road, 2-E, San Diego, Calif. 92123, and Arthur O. Sellgren, 8750 Mel Manor Drive, La Mesa, Calif. 92041

Continuation-in-part of Ser. No. 195,598, Nov. 4, 1971, abandoned. This application June 8, 1973, Ser. No. 368,336

Int. Cl.[2] B24B *19/00;* **B21K** *5/12*

U.S. Cl. 51—221 BS **2 Claims**

1. A knife sharpener for holding a knife at a predetermined angle on a whetstone, comprising:

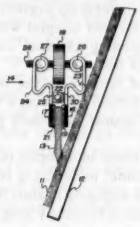
first and second members hingedly attached at their central portions by pivotally connected opposed extensions on said members;

first and second opposite surfaces at one end of said first and second members, said surfaces being of a dimension for carrying a knife therebetween;

adjustment means at another end of said first and second members operable for adjusting the distance between said first and second surfaces;

first and second shoulders on said first and second members, respectively, and extending outwardly therefrom, said first and second shoulders being dimensioned for

defining a predetermined angle between a knife carried by said first and second surfaces and a whetstone;



and said adjustment means comprises a single thumb wheel positioned between said first and second members that is threadably coupled to said first and second members.

3,924,361

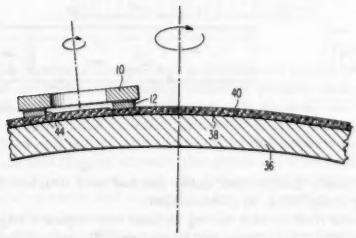
METHOD OF SHAPING SEMICONDUCTOR WORKPIECES

Joseph Paul White, and Paul Joseph Del Priore, both of Somerville, N.J., assignors to RCA Corporation, New York, N.Y.

Division of Ser. No. 364,660, May 29, 1973, Pat. No. 3,888,053. This application Nov. 29, 1974, Ser. No. 528,404

Int. Cl.[2] B24B *1/00, 13/01*

U.S. Cl. 51—283 **3 Claims**



1. A method of polishing a major surface of each of a plurality of disc-like workpieces comprising:

mounting said workpieces in a generally annular array on a flat surface of a mounting plate,

disposing said mounting plate on a convex polishing surface with the surface of each workpiece to be polished in direct contact with said polishing surface, and

rotating said mounting plate relative to said polishing surface about an axis perpendicular to said mounting plate flat surface.

3,924,362

SANDING PAD ASSEMBLY

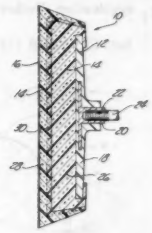
Howard J. McAleer, Marine City, Mich., assignor to Formax Manufacturing Corporation, Detroit, Mich.

Filed Oct. 25, 1974, Ser. No. 518,056

Int. Cl.[2] B24D *17/00;* **B24B** *1/00;* **B24D** *3/00*

U.S. Cl. 51—358 **31 Claims**

22. A sanding pad assembly comprising: a pad member, back up means secured to said pad member for supporting said pad member for rotation, said pad member comprising a core and an outer layer, one of said core and said outer layer being made of soft flexible foam material, the other of said core and said outer layer being made of a semi-rigid foam



material, said outer layer extending over the work surfaces of said pad member.

3,924,363

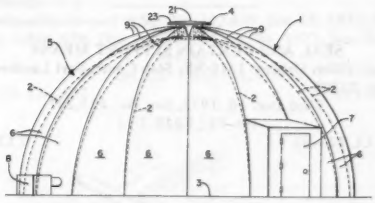
INFLATABLE SHELTER

Richard D. Candle, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 22, 1974, Ser. No. 472,315

Int. Cl.[2] E04B *1/345*

U.S. Cl. 52—2 **19 Claims**



1. An inflatable enclosure having its lower peripheral edges attached to a base, the enclosure comprising:

A. a plurality of flexible non-parallel reinforcing members, each having a first end attached along the periphery of the base in spaced relationship from each other;

B. a second end of each of the members being fastened at a location radially inwardly of the first ends, in closer spaced relationship to each other than the first ends, thereby causing the members to converge toward each other from the first to the second ends thereof; and

C. a cover envelope comprising elongated strips of flexible sheet material of substantially uniform width throughout their length attached between the reinforcing members;

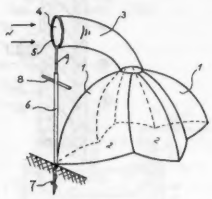
D. the width of each strip of sheet material being substantially the same as the distance between the reinforcing members at the first ends but becoming progressively greater than the distance between the reinforcing members radially inwardly toward the second ends as the members converge toward each other;

E. the excess width of material between the members being forced outwardly by internal pressure in the enclosure when inflated whereby the sheet material extends a greater distance outwardly of the reinforcing members near the radially inwardly positioned second ends than it does near the radially outwardly positioned first ends.

3,924,364
WIND-INFLATABLE TENT

Cornelis Eerkens, van Lawick van Pabst Straat 32, Arnhem, Netherlands

Filed June 2, 1972, Ser. No. 259,294
Claims priority, application Netherlands, July 15, 1971, 7109798
Int. Cl.[2] E04B *1/345*
U.S. Cl. 52—2 5 Claims

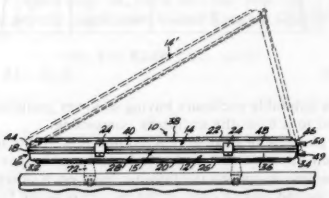


1. A habitable wind-inflatable tent, comprising flexible walls forming the sides and top thereof, a wind-catch member integral with said walls and adapted to receive wind pressure and direct same to the interior of said tent through an opening in said walls, means for providing access and egress to and from said tent, and means integral and cooperable with said wind-catch member adapted to be secured to the ground and to support said wind-catch member in spaced substantially fixed relation thereto, said wind-catch member support means also serving to maintain said tent in an erected state, said tent being sufficiently light-weight so as to be manually transportable as a unitary assembly from one location to another.

3,924,365
SEAL AND CURTAIN SUPPORT MEANS

Robert Elliott Orberg, 1410 NE. 56th Court, Fort Lauderdale, Fla. 33308

Filed Dec. 10, 1973, Ser. No. 423,207
Int. Cl.[2] E04B *1/12*
U.S. Cl. 52—63 7 Claims



1. In a portable compartment for use on vehicles, a seal and curtain support means in combination with confronting peripheral lip portions of upper and lower shells of a portable car top compartment which are hinged together along one end, the shells being movable between closed and open positions and include curtain means, fixed relative thereto, to form an enclosed compartment therein when the shells are in an open position, said seal and curtain support means comprising:

A. a first elongated extrusion extending around the upwardly projecting peripheral lip of the lower shell including

1. a downwardly opening channel portion in fixed engagement over the peripheral lip portion thereof,
2. a shelf portion at the top of said channel portion,
3. a first means formed integral with and inwardly of said channel and shelf portions carrying the lower peripheral edge of the curtain,

B. a second elongated extrusion extending around the downwardly projecting peripheral lip of the upper shell including,

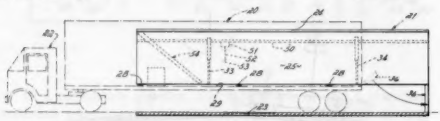
1. an upwardly opening channel portion in fixed engagement over the peripheral lip portion thereof,
2. a second means formed integral with and inwardly of said upwardly opening channel carrying the upper peripheral edge of the curtain,
3. a seal bead fixed relative to the bottom of said upwardly opening channel providing a weather-tight sealing engagement against said shelf portion when said shells are closed;

C. means to hold the shells in an open position, said downwardly opening channel including a relatively short, depending outer flange engaging against the outer surface of said lower lip portion, a relatively long, depending flange engaged against the inner surface of said lower lip portion and providing a reinforcement therebehind and a top web connecting between said flanges defining said shelf, said upwardly opening channel including a relatively short upwardly extending flange engaging against the outer surface of said upper lip portion, a relatively long upwardly extending flange engaged against and reinforcing the inner surface of said upper lip portion and a bottom web connecting between said flanges.

3,924,366
EASILY ERECTED ROOF STRUCTURE FOR MODULAR BUILDINGS

Louis L. Gibbs, 1547 Silverglade Court, Cincinnati, Ohio 45240

Filed Aug. 26, 1974, Ser. No. 500,572
Int. Cl.[2] E04B *1/343*, *1/344*
U.S. Cl. 52—69 9 Claims



1. An easily transported, easily erected roof structure for a building comprising, in combination:

a central roof section having at least two opposed edges;

a plurality of legs connected to said central roof section and constructed to depend downwardly from said central roof section for supporting said central roof section spaced above a base, each said legs including at least two sections with one of each said leg section telescopically interfitting with at least one other leg section;

releasable means connected to the leg sections of each said leg to selectively lock said legs against telescopic movement when said releasable means are unreleased, and permit telescoping of each said support leg to enable said central roof section to move closer to said base under the force of gravity when said releasable means are released;

a pair of side roof sections each pivotally attached along an inner edge thereof to a different said opposed edge of said central roof section, each said side roof section having an outer edge and being pivotal between a downwardly folded position wherein said side roof section is disposed vertically in a generally perpendicular relation to said central roof section to facilitate compact storage and an erect position whereat said side roof section is pivoted upwardly relative to said folded position to form a continuous roof surface with said central roof section;

said releasable means when unreleased maintaining the length of said legs longer than the distance between the inner and outer edges of said side roof sections to permit said legs to support said central roof assembly at a predetermined height above said base with said outer edges of

said side roof sections spaced above said base when said side roof sections are folded: and

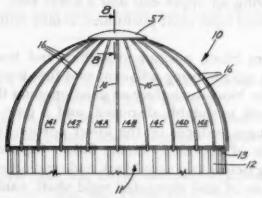
side roof section pivoting means directly connected to said side roof sections, operative in response to gravity-induced downward movement of said central roof section toward said base below said specified height accompanied by telescoping shortening movement of said support legs, to react against said downward movement on said side roof section in a direction to pivot said side roof section outwardly and upwardly relative to said central roof section from said folded position toward said erect position, whereby the energy required to move said side roof sections to said erect position from said stored position is obtained by a gravity-induced decrease in height of said central roof section upon selective release of said releasable means and consequent shortening of said telescoping legs.

3,924,367

ROOF STRUCTURE

Richard P. Stewart, Wayzata, Minn., assignor to American Farm Systems, Inc., Tripoli, Iowa

Filed Feb. 27, 1974, Ser. No. 446,211
Int. Cl.² E04B *1/32, 7/00*
U.S. Cl. 52—80 **14 Claims**



1. A structure comprising: a plurality of panels and elongated rib means connecting adjacent panels, each of said panels having outwardly directed side flanges, said flanges having continuous reversing S-curved shapes extending the length of said panels, said rib means having pockets to accommodate said flanges whereby the panels are connected to the elongated rib means, each rib means comprising an inside channel member and an outside channel member, said inside and outside channel members having side portions in engagement with each other to center the channel members relative to each other, one of said channel members having sides with offset portions forming said pockets for receipt of said continuous reversing S-curved flanges.

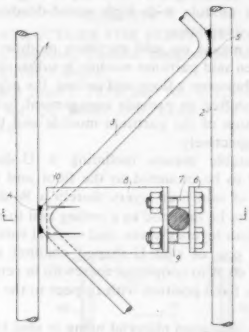
3,924,368

BUILDING CONSTRUCTION HAVING THREE-HINGED ARCHED LATTICE GIRDERS

Kristen Hald Pedersen, Hvidovre, Denmark, assignor to Aktieselskabet Jens Villadsens Fabriker, Herlev, Denmark

Filed Feb. 1, 1974, Ser. No. 438,535
Claims priority, application Denmark, Feb. 2, 1973, 566/73
Int. Cl.² E04B *1/32*
U.S. Cl. 52—86 **3 Claims**

1. A building comprising a bearing construction consisting of a number of parallel 3-hinged arched lattice girders which are interconnected by stays, each arched lattice girder comprising at its outer side a flange of a circular cross-sectional shape, and a roof covering comprising plate elements of a plastics material, said plate elements being mounted parallel to one another and to the flanges at the outer sides of said arched lattice girders, each plate element comprising at its longitudinal edges arched edge portions having a periphery extending over at least **180°**, the arched edge portions of one plate element partially overlapping the arched edge portion of an adjacent plate element so as to interconnect said plates, the flanges at the outer sides of the arched lattice girders being mounted within said overlapping arched edge portions of two adjacent plate elements so as to attach the roof covering to said girders, characterized in that the head and foot of each



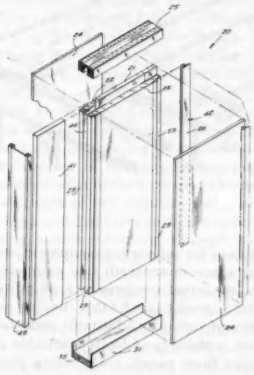
arched lattice girder are interconnected by zigzag shaped struts and that the stays are connected to the arched lattice girders by stay-connecting means which are firmly attached to the feet of the girders and are releasably attached to the heads of the girders.

3,924,369

ADJUSTABLE MODULAR PARTITION SYSTEM

Michael C. Guarino, Rumson, and Frank Cacossa, Livingston, both of N.J., assignors to M. C. Guarino Associates, Inc., Belleville, N.J.

Continuation-in-part of Ser. No. 327,609, Jan. 26, 1973, Pat. No. 3,866,370. This application Aug. 24, 1973, Ser. No. 391,307
Int. Cl.² E04B *2/82*
U.S. Cl. 52—122 **10 Claims**



1. An adjustable modular partition comprising:

an inner layer of a first fire-resistant and sound-deadening material having opposing sides;

a second layer of a second fire-resistant and sound-deadening material on each side of said first material so that said first material is located therebetween;

a third layer of a third fire-resistant and sound-deadening material on the sides of said second material distal from said first material so that said first and second material are located therebetween;

a fourth layer of a fourth fire-resistant and sound-deadening material on the sides of said third material distal from said second material so that said first, second and third material are located therebetween;

means for fastening said four layers together to form a partition module with high sound-deadening and fire-resistive qualities;

adjustable means on said partition module positioned so that when said partition module is substantially vertically located between a floor and ceiling, the adjustable means can be shifted to provide engagement between the top and bottom of the partition module and the ceiling and floor respectively;

said adjustable means including a U-shaped channel adapted to be mounted to the floor and to receive the bottom of said four layers therein a W-shaped channel adapted to be fastened to a ceiling and to receive the top of said four layers therein, and vertical variation means in at least one of said U-shaped channel and W-shaped channel so as to cooperate therewith in retaining the four layers in fixed position with respect to the floor and ceiling; and

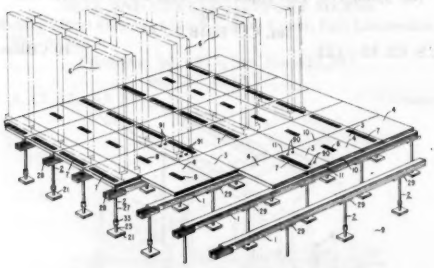
glass fiber insulation material being in said U-shaped channel.

3,924,370

RAISED FLOOR WITH CLAMPED PANEL SUPPORT

Walter Bartholomew Cauceglia, Wayne; Charles Gerlt, Livingston, and Luis Arturo Peralta, Mendham, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 24, 1974, Ser. No. 491,343
Int. Cl.[2] E04F *13/08*
U.S. Cl. 52—126 **11 Claims**



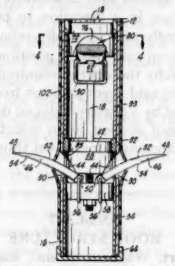
1. A raised floor for supporting equipment above a subfloor and providing space underneath said equipment for cabling and ancillary apparatus comprising a plurality of beams in spaced parallel relation to each other running along one direction, a plurality of vertically adjustable pedestals for supporting each beam, a plurality of freely insertable and removable first rectangular floor panels each having planar edges and each spanning between a pair of adjacent beams and having opposite ends resting on portions of said adjacent beams, a plurality of second individually insertable and removable rectangular floor panels having planar edges underlying said equipment, each second panel spanning between a pair of adjacent beams and having opposite ends resting on portions of said adjacent beams, and means for fixedly supporting said beams in said spaced parallel relation comprising means for rigidly attaching each pair of adjacent second panels to the common beam on which said pair of adjacent second panels rest.

3,924,371

GROUND ANCHOR APPARATUS

Raymond A. Kidwell, 114 N. Fifteenth St., Frederick, Okla. 73542

Filed Nov. 6, 1974, Ser. No. 521,287
Int. Cl.[2] E02D *5/80*
U.S. Cl. 52—161 **23 Claims**



1. A ground anchor apparatus which comprises:

an elongated tubular housing having a first pair of oppositely facing slots disposed in the opposite sides thereof, and having an upper end and a lower end;

an elongated rigid shaft positioned axially within said housing;

a first cam block positioned within, and bearing slidably against, said housing adjacent said first pair of slots, said first cam block including an axial opening through which said shaft is slidably disposed, and a pair of oppositely facing cam surfaces on the lower portion thereof;

a first pair of oppositely facing flukes disposed within said housing below said cam block and on diametrically opposite sides of said elongated rigid shaft, said flukes being positioned to contact said cam surfaces of said cam block and to extend through said first pair of slots in said housing upon the upward movement of said flukes; and

means movably connecting said flukes to said shaft so that when said shaft is moved axially upward within said housing, said flukes are moved upwardly into sliding contact with said cam surfaces of said cam block thereby extending said flukes upwardly and outwardly from said housing through said first pair of slots, said means for movably connecting said flukes to said shaft including peripheral portions bearing against the inside of said housing and a central portion receiving and connected to said shaft, whereby said shaft is supported in a central position in said housing by said connecting means.

3,924,372

DROP-OUT FIRE VENT

Joseph R. Anghinetti, Kennebunkport; Paul A. Couture, Emery Mills, and Arthur P. Jentoft, Kennebunkport, all of Maine, assignors to Wasco Products, Inc., Sanford, Maine

Continuation of Ser. No. 291,978, Sept. 25, 1972, abandoned.
This application Mar. 18, 1974, Ser. No. 452,066
Int. Cl.[2] E04B *7/18*
U.S. Cl. 52—232 **15 Claims**

1. A drop-out fire vent for a building comprising;

a pair of heat softenable plastic domes arranged one above the other,

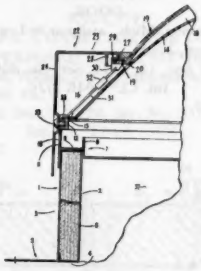
means supporting the lower dome at its periphery over a skylight opening in the building and defined by vertical extending enclosing well walls,

said lower dome having a periphery extending outwardly of the inner periphery of said supporting means,

said upper dome being smaller than said lower dome and having its periphery terminating inwardly of the inner periphery of said supporting means to thereby expose a peripheral area of the lower dome that is not covered by

the upper dome and that extends between the spaced peripheries of the domes,

and retainer means secured to said supporting means and including a flange extending to the periphery of the upper dome holding said upper dome in vertically spaced stationary relation over the periphery of the lower dome and in contact with the upper dome, said flange providing an enclosure covering the exposed peripheral area of the lower dome and extending between said periphery of said upper dome and said periphery of said lower dome.

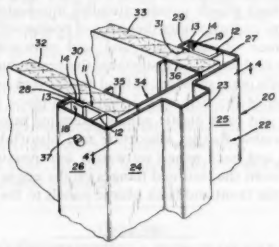


3,924,373

COMBINATION SCREW ALIGNING AND FRAME REINFORCING BRACE

Thomas E. Lizdas, and Bulow A. Peterson, both of Kewanee, Ill., assignors to United States Gypsum Company, Chicago, Ill.

Filed May 22, 1974, Ser. No. 472,248
Int. Cl.[2] E06B *1/12*
U.S. Cl. 52—213 **11 Claims**



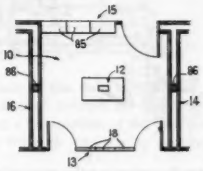
1. An integral combination fastener alignment and frame reinforcing brace adapted to be utilized with a quickly assembled door frame formed of a plurality of members each generally channel-shaped in cross-section and having a flange defining a channel-form recess therewith provided for receiving said brace, said brace being generally U-shaped and comprising a main web formed solely of two planar portions consisting of a first portion and an offset portion offset at a line substantially transverse with respect to said main web and lying in a plane substantially parallel to that of said first portion, a pair of spaced-apart substantially parallel planar flanges connected one to the end of and substantially perpendicular to said first portion and the other to the end of and substantially perperpendicular to said offset portion, said main web having a fastener-aligning aperture provided therein and said offset portion having detent means provided therein, whereby said offset portion of said main web is adapted to be inserted into the channel form recess of said door frame and retained therein by said detent means, and the outer surface of said first main web portion is adapted to be positioned substantially flush with the outer surface of the flange of said door frame defining said recess.

3,924,374

WALL STRUCTURE FOR HOSPITAL ROOMS

Jean Volper, Chomedey, Canada, assignor to Millet Roux & Cie., Ltee., Laval, Canada

Filed June 7, 1974, Ser. No. 477,518
Int. Cl.[2] E04H *3/08*; E04B *2/76*
U.S. Cl. 52—243 **9 Claims**



1. A wall structure especially adapted for hospital operating rooms comprising:

a. a plurality of adjacent panel units, each unit including:

i. a pair of sheets of rigid material arranged in spaced relationship so as to form a chamber therebetween;

ii. top, bottom and side spacing elements disposed between the inner marginal edges of the sheets and extending completely around the periphery thereof to maintain the sheets in spaced relationship; each said side spacing element defining a U-shaped opened channel having centrally therein a longitudinal groove defined by a pair of spaced flange walls extending lengthwise of said channel, the opposing faces of said flange walls having thereon lengthwise corrugations;

iii. a hardened foam plastic material received in said chamber;

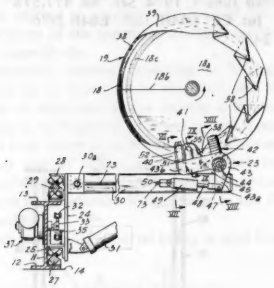
b. a series of vertical posts disposed between successive panel units for securing said units thereto, each said post defining a U-shaped opened channel with the opposite side walls thereof in covering arrangements over the respective open sides of the U-shaped channels of the side spacing elements of two adjacent panel units, said side walls having a series of holes vertically spaced therealong;

c. fastening means extending through said holes and engagedly received in said groove for securing said panel units to said vertical posts;

d. first anchoring means for securing said posts to the floor structure of said rooms and second anchoring means for securing said posts to the ceiling structure of said rooms;

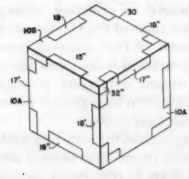
e. resilient plinth means defining a longitudinal channel of U-shaped cross-section receiving therein the outer lower marginal edges of said sheets and the lower part of said vertical posts; the U-shaped channel of said resilient plinth means including a central recess in the bottom wall thereof; a longitudinal bar received in said recess; said first anchoring means further securing said bar and said resilient plinth means to the floor structure of the room; said resilient plinth means including opposite upstanding walls inwardly urged toward each other due to the resiliency therein thereby providing an abutting pressure on said outer lower marginal edges of said sheets when received between said upstanding walls.

3,924,375
AUTOMATIC CRIMPER
Lawrence A. Brenner, Brookfield, Wis., and Charles H. Scholl, Vermilion, Ohio, assignors to Beloit Corporation, Beloit, Wis.
Filed May 23, 1974, Ser. No. 472,523
Int. Cl.² B65B 11/04
U.S. Cl. 53—380 24 Claims



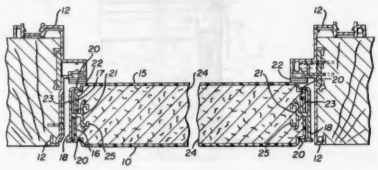
4. apparatus for crimping the projecting end of roll wrapper onto the end of a paper roll, comprising:
a first member for starting displacement of the projecting wrapper end from cylindrical relation to the roll end toward the roll end;
a second member which operates after the first member to tuck the displaced end toward the roll end;
a third member following the tucking member for rolling the tucks into flat successive crimps against the roll end; and
said second member comprising a fixed tucking finger having a semicylindrical tucking tip.

3,924,376
CUBOIDAL STRUCTURE
Sukeo Tsurumi, P.O. Box 669-11, Siyoze, Nisinomiya, Hiyogo, Japan
Continuation-in-part of Ser. No. 200,081, Nov. 18, 1971, Pat. No. 3,813,841. This application Mar. 22, 1974, Ser. No. 454,022
Claims priority, application Japan, June 25, 1971, 46-45692; June 25, 1971, 46-45693
Int. Cl.² E04C 1/10; A63H 33/08
U.S. Cl. 52—593 2 Claims



1. A cube structure comprising, in combination, six square face plates each having two pairs of opposite sides, one side of each pair containing a central recess and the other side having a central projection, said projection and said recess being substantially the same length, and the depth of said recesses being the same as the height of said projections, said face plates being the same thickness as the depth of said recesses and the height of said projections, and two of said square face plates each having a square extension forming a corner between two of said sides of each of said two face plates, one of said two sides containing a recess and the other having a projection, said square extensions having sides equal to the depth of said recesses and the height of said projections, said face plates being assembled into a perfect cube structure having edges with each edge having a projection of one face plate fitted into the recess of another face plate.

3,924,377
DOOR
Clyde E. Gill, Lennon, Mich., assignor to Lennon Manufacturing Inc., Lennon, Mich.
Filed Apr. 12, 1974, Ser. No. 460,501
Int. Cl.² E04B 2/20
U.S. Cl. 52—620 1 Claim



1. A door comprising spaced, substantially parallel front and back plastic panels each having peripheral, distortable, inturned flanges thereon extending at a right angle to the plane of the panel, elongate, rigid, metallic casing members secured on the peripheral edges of said door, said casing members each comprising a substantially flat strip parallel to the plane of the inturned flanges and having a width less than the thickness of the door and having an inner surface and an outer surface, said strips having continuously extending inturned right angular flanges on their longitudinal edges, a web integral with the strip on the inner surface thereof intermediate the longitudinal edges and extending axially along the strip and disposed substantially perpendicular to the plane of the strip, a pair of laterally outwardly extending flanges on the web extending parallel to and spaced from the inner surface of the strip, the distortable flanges on the edge portions of said front and back plastic panels extending into juxtaposition with said web on opposite sides thereof and positioned between the inner surface of said strips and said outwardly extending flanges on said web, said distortable flanges including an offset portion defining a shoulder behind the flanges on the longitudinal edges of the strip, and a foamed in place core between said front and back plastic panels extending into contact with said distortable flanges, distorting said distortable flanges of said front and back panels outwardly into proximity with the strips between the inturned flanges on the edges thereof so as to secure the front and back plastic panels to the casing members.

3,924,378
INTERLOCKING JOINT FOR OVERLYING SHEET MATERIAL
Otto P. Hafner, 1321 Paddock Way, Cherry Hill, N.J. 08034
Division of Ser. No. 384,494, Aug. 1, 1973, Pat. No. 3,862,485. This application Aug. 16, 1974, Ser. No. 497,883
Int. Cl.² F16B 5/07
U.S. Cl. 52—758 D 1 Claim

1. An interlocking joint fastening together overlying sheets of metal or other material having permanently deformable properties, said sheets including at least a first sheet and an overlying second sheet, said sheets having interior and opposed exterior surfaces, said overlying sheets having been pierced discontinuously along a boundary line defining a minor area, the material of said first and second sheets within said minor area having been displaced out of the respective planes of the major-area material of said first and second sheets forming first and second overlying bridge portions, material of said first bridge portion being spread laterally over the exterior surface of the major-area material of said second sheet beyond the piercings therein, the improvement charac-

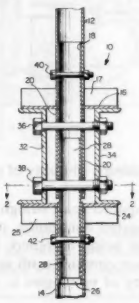
terized by the material of said second bridge portion being confined within the limits defined by said piercings during the application of compressive force to the exterior surface of said second bridge portion, whereby said first bridge portion is spread laterally beyond the limits of said second bridge portion.

3,924,379

TELESCOPIC CONNECTOR FOR COAXIALLY SUPERPOSED FRAME MEMBERS

Leigh Hutchinson, Wilton, Conn., assignor to Harsco Corporation, Camp Hill, Pa.

Filed Dec. 9, 1974, Ser. No. 531,051
Int. Cl.[2] E04H *12/00*
U.S. Cl. 52—637 **6 Claims**



1. A modular support and scaffolding structure, including,
a. a first joint section, said section including first and second tubular sections in partial telescoping relation,
b. a first plate surrounding said first tubular section and abutted by the upper end of said second tubular section, said first plate lying in a plane orthogonal to the common axis of said first and second tubular sections,
c. said plate, first and second tubular sections being joined together to form a rigid joint section,
d. a second joint section, said section including third and fourth tubular sections in partial telescoping relation,
e. the innermost of said third and fourth tubular members telescopingly engaging the interior of the innermost one of said first and second tubular members,
f. a second plate, attached to the upper exterior end of said fourth tubular member.

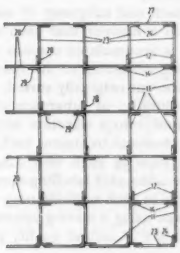
3,924,380

LATTICE FOR SUPPORTING A BUNCH OF BAR-SHAPED MEMBERS

Hendricus Johannes Adrianus Quaadvliet, Groet, Netherlands, assignor to Stichting Reactor Centrum Nederland, The Hague, Netherlands

Filed June 6, 1973, Ser. No. 367,408
Claims priority, application Netherlands, June 12, 1972, 7207937
Int. Cl. E04c *2/44*
U.S. Cl. 52—664 **6 Claims**

1. A lattice for supporting a plurality of elongated members taking part in a process of heat exchange, such as nuclear fissile fuel rods, said lattice comprising
a plurality of partitions, each of said partitions having a spaced lip portion extending therefrom in the general plane of said strap, and a spaced tab portion disposed in a plane generally perpendicular to said lip portion, a plurality of partitions being disposed in generally the same plane in each of a plurality of columns forming the lattice,
a plurality of straps disposed in planes generally perpendicular to the planes of said partitions whereby each strap forms a row of the lattice, each of said straps having a plurality of apertures formed therein receiving said lip portions of said partitions,
said partitions being disposed so that a lip portion of one partition passes through the aperture of a strap and is attached to a side face of the next consecutive partition so that the partitions in each column are dipsosed in generally the same plane, and a tab portion of the one partition abuts a face of the strap through which a lip portion of the one partition is passed.

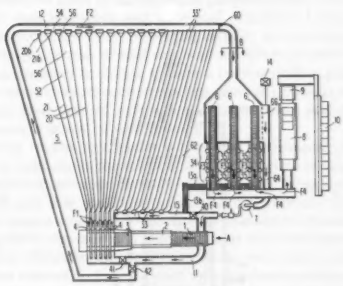


3,924,381

SYSTEM FOR THE HANDLING OF FRUITS AND VEGETABLES

Alberto Carmelo Sardo, Sceaux, France, assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Apr. 11, 1975, Ser. No. 567,211
Claims priority, application Italy, Apr. 18, 1974, 50471/74
Int. Cl.[2] B65B *35/00*; **B65C** *1/00*
U.S. Cl. 53—3 **8 Claims**



8. A method for the accumulation and processing of produce comprising the steps of:
a. feeding a batch of produce into a produce cleaning, sorting, accumulating, labelling and sanitizing apparatus;
b. cleaning the batch of produce;
c. sorting the batch of produce into a plurality of groups of produce such that each group of produce consists of produce of substantially the same size produce items;
d. accumulating said produce comprising each of said group of produce items separately, in a water solution chemical treatment bath;
e. feeding said plurality of groups of produce, seriatum, to a selection area via a chaneled water solution chemical treatment bath;
f. separating each group of said produce into subgroups of first quality produce and second quality produce;
g. conveying said subgroup of first quality produce to a labelling apparatus;

h. labelling each item in said subgroup of first quality of produce using said labelling apparatus;
i. waxing each item in said subgroup of first quality produce with wax using a waxing apparatus;
j. packing said items in said subgroup of first quality product for shipment;
k. feeding said subgroup of second quality produce into an accumulation basin;
l. accumulating each said subgroup of said second quality produce in such a manner that each said subgroup of produce which is accumulated consists of second quality produce of a size according to the sizes into which said batch of produce was originally sorted;
m. feeding said plurality of subgroups of second quality produce, seriatum, into a selection area via a chaneled water solution chemical treatment bath;
n. labelling each item in each said subgroup of second quality produce using said labelling apparatus;
o. waxing each item in each said subgroup of second quality produce with wax using a waxing apparatus;
p. packing said items of second quality produce for shipment.

3,924,382

METHOD FOR MAKING CARTRIDGES CONTAINING PRESSURE GAS AND MEANS FOR CARRYING OUT THIS METHOD

Franz Josef Overkott, Gevelsberg, Germany, assignor to Dr. Carl Ullrich Peddinghaus, Wuppertal, Germany

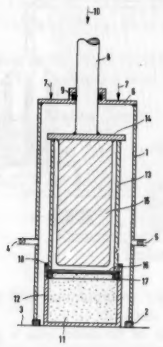
Filed Jan. 11, 1973, Ser. No. 322,777

Claims priority, application Germany, Jan. 11, 1972, 2201177; Dec. 14, 1972, 2261277

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] B65B *31/02*

U.S. Cl. 53—7 **5 Claims**



1. A method of making cartridges containing a pressurised gas, particularly for use in hydro-pneumatic oscillation dampers, comprising fitting the cartridge with a loosely fitted sealing cap lying on a sealing ring surrounding an opening of the cartridge, subjecting the cartridge to a pressurised gas until it has filled with the pressurised gas, pressing the sealing cap against the sealing ring of the cartridge with a pressure exceeding the pressure inside the cartridge, subjecting the cartridge and sealing cap to normal ambient atmospheric pressure and firmly securing the sealing cap to the outer wall of the cartridge.

3,924,383

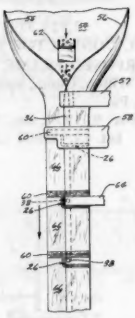
METHOD FOR MAKING A PLASTIC BAG

Donald A. Heger, 3844 E. Tiffin Ave., Des Moines, Iowa 50317

Filed June 5, 1974, Ser. No. 476,563

Int. Cl.[2] B65B *9/08, 61/18*

U.S. Cl. 53—14 **5 Claims**



1. A method for making a plurality of plastic bags comprising:

forming a plurality spaced apart straight line seals across the width of an elongated continuous plastic tube member, said tube member being flattened, and having opposite lateral edges which combine with said straight line seals to form a plurality of rectangles in end to end relationship;

forming a reinforcing seal adjacent each of said straight line seals, each of said reinforcing seals commencing at one lateral edge of said tube member in a point spaced below said straight line seal and continuing partially across the width of said tube member in a direction parallel to said straight line seal and thence upwardly to join said straight line seal at a point spaced inwardly from the other lateral edge of said tube member;

placing a grommet in said tube members in the space between said reinforcing seal and said straight line seal; and severing said tube member transversely into a plurality of containers with said straight line seals forming upper sealed edges of each of said containers.

3,924,384

METHOD AND APPARATUS FOR CAPPING CONTAINERS

Alfred W. Kinney, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

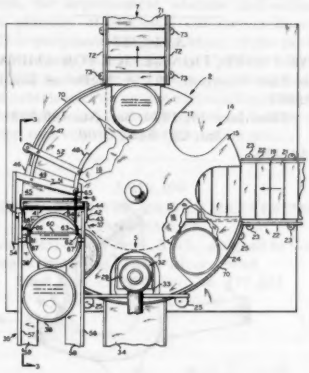
Filed Jan. 30, 1975, Ser. No. 545,357

Int. Cl.[2] B65B *7/28;* **B67B** *3/00, 3/22*

U.S. Cl. 53—38 **20 Claims**

12. In a method comprising conveying upstanding containers through an arcuate path having an inner concave side and an outer convex side, sequentially dispensing individual closures having a depending peripheral flange at a closure dispensing station immediately above a closure engaging station of said arcuate path by having the leading upper edge portion of a container being moved through said closure engaging station engage the bottom segment of the leading portion of the depending peripheral flange of the closure in said closure dispensing station, with the general line of movement of a closure through said closure dispensing station being in a plane at least approximately tangential to said arcuate path at said closure engaging station, the improvement comprising coercing a closure entering said closure dispensing station to cause the thus engaged closure to be positioned for proper alignment for the initial engagement of the closure in said closure dispensing station by the container entering the closure engaging station, and laterally moving the closure out-

wardly toward said outer convex side of said arcuate path as the closure is being withdrawn from said closure dispensing station by the continued arcuate motion of the respective



container, to thereby maintain the alignment of the closure being dispensed with the respective container as said closure being dispensed is united with the respective container.

3,924,385

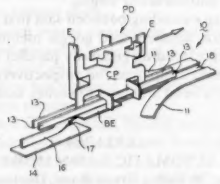
APPARATUS FOR ENCLOSING CONTAINER GROUPS

Richard T. Walter, Norristown, Pa., assignor to Container Corporation of America, Chicago, Ill.

Filed Apr. 7, 1975, Ser. No. 565,574

Int. Cl.² B65B *21/24*

U.S. Cl. 53—48 **4 Claims**



1. Apparatus for enclosing a group of articles, such as cans or bottles, arranged in side-by-side rows within a carton which has bottom and side panels and an internal partition which includes a longitudinal member located between the rows of articles, transverse elements extending from the longitudinal member between the articles of each row, and a base element hingedly attached to a lower portion of the longitudinal member, said apparatus comprising:

a. conveying means for said articles;

b. means for moving said partition toward said articles;

c. means for folding said base element to a position normal to said longitudinal member;

d. means for bringing said partition and said articles into juxtaposition with a longitudinal member extending between the rows of the articles, the transverse members extending between the articles of each row, and the base element underlying at least one of the articles;

e. means for enclosing said article group in said carton after said partition is in place.

3,924,386

MACHINE FOR PACKAGING ROD-SHAPED ARTICLES

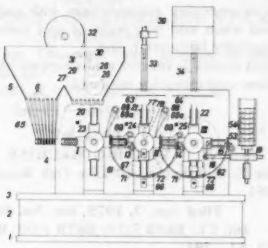
Alfred Schmermund, 62 Kornerstrasse, 5820 Gevelsberg, Germany

Filed Oct. 5, 1973, Ser. No. 403,732

Claims priority, application United Kingdom, Oct. 19, 1972, 48186/72

Int. Cl.² B65B *19/30, 11/28*

U.S. Cl. 53—60 **15 Claims**



1. A high speed multi-stage machine for monitoring and wrapping blocks of rod-shaped articles, the machine comprising, in combination:

input means to receive a plurality of rod-shaped articles;

a first rotatable translator member;

at least one further rotatable translator member;

mounting means supporting said first and said further translator members to be each rotatably displaceable about a respective one of substantially horizontal and mutually parallel axes of rotation, to be mutually spaced apart in a direction parallel to said axes of rotation, and to locate next adjacent ones of said translator members in at least partially mutually overlapping relationship;

a plurality of pairs of substantially parallel axially extending side wall members and an equal plurality of base wall members each interconnecting radially lower portions of a respective pair of said side wall members in each translator member to define therein a corresponding plurality of compartments each extending generally radially to said respective axis of rotation and each being adapted to receive a block of said articles;

insertion means to transfer a block of rod-shaped articles from said input means into a compartment in said first translator member on said compartment being disposed with said side walls thereof substantially horizontal;

drive means coupled to each said translator member to angularly displace said first translator member stepwise in a first direction of rotation to cause each said compartment thereof to pass through an uppermost position with said side walls thereof substantially vertical before said compartment passes through a lowermost position with said side walls thereof substantially vertical, to angularly displace said at least one further translator member stepwise in a direction of rotation opposite to said first direction, and to locate any of said compartments in any one of said translator members in a selective axial end-to-end relationship with one of said compartments in a translator member next adjacent said one translator member;

monitoring means to monitor said block of articles in said compartment in said first translator member on said compartment being disposed in said uppermost position;

at least one reciprocatable pusher means co-ordinated with said drive means to pushably transfer a block of said articles between said mutually end-to-end aligned compartments of next adjacent said translator members during a forward stroke displacement of said pusher means when said aligned compartments are each disposed with said side walls thereof substantially horizontal;

at least one wrapper feeder means synchronized with said angular displacement of a respective one of said translator members to feed a wrapper into an empty compartment in said at least one further translator member on said empty compartment being disposed in an uppermost position with said side walls thereof substantially vertical;

at least one wrapper folder means to fold a projecting wrapper portion over said block of said articles in one said compartment;

extractor means to extract a wrapped block of said articles from one of said compartments when said compartment is in operative juxtaposition with said extractor means and when said side walls of said compartment are substantially horizontal; and

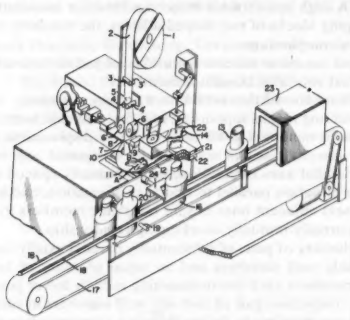
output means to receive said wrapped block of said articles from said extractor means.

3,924,387

BANDING MACHINE

Anatole E. Konstantin, 10 Live Oak Road, Norwalk, Conn. 06851

Filed Apr. 3, 1975, Ser. No. 564,692
Int. Cl.[2] B65B *7/28*; **B67B** *5/00*; **B65C** *3/18*
U.S. Cl. 53—291 **10 Claims**



1. Apparatus for accurately placing a band of shrinkable plastic film over an article, comprising in combination:

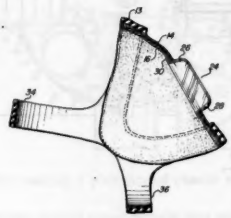
1. means for dispensing shrinkable plastic tubing, flattened in a first plane and having crimped edges,
2. means for opening a section of said flattened tubing and for reflattening the opening tubing in a plane perpendicular to said first plane without crimping its new edges.
3. means for feeding a preselected length of said reflattened tubing into position for being cut,
4. means for cutting said preselected length of reflattened tubing into bands,
5. means for moving said bands into vertical alignment with an article banding station, said moving means comprising a rotatable horizontally disposed plate having at least one elongated slot, extending through said plate, said slot having perpendicular major and minor axes, the rearward portion of said slot being shaped such that its sides support the rear hemispherical half of the band in a vertical position, said minor axis being approximately equal in length to the outside diameter of said tubing whereby when the reflattened tubing — which extends through said slot and lies in the plane parallel to major axis — is cut, the band will spring open in said slot with the edges of the band being slightly compressed by the sides of the slot,
6. band stopping means, located in vertical alignment with said article banding station, said means being shaped such that its concave inner surface supports the front hemispherical half of the band in a vertical position, whereby on mating with the rearward portion of said slot, a collar surrounding said band is formed which holds the band in an open position, in vertical alignment with the article banding station, and
7. means vertically aligned with said article banding station for pushing the opened band through said collar and over said article.

3,924,388

EYE PROTECTION DEVICE FOR AMINALS

Anna Mae Elsie Morrison, 901 W. McDowell Road, Phoenix, Ariz. 95007

Filed June 19, 1974, Ser. No. 480,718
Int. Cl.[2] B68C *5/00*
U.S. Cl. 54—80 **1 Claim**



1. An eye protection device adapted to protect an animal during the external application of sprays, dusts and similar substances, comprising:

a. a substantially moisture impervious flexible mask portion having a general triangular configuration having first, second and third sides, and adapted to snugly engage a portion of the animal's face in the area of the animal's eyes, said mask being constructed of a layered material having an outer fabric layer and an inner substantially waterproof layer having frictional characteristics to engage the animal's face to prevent slipping;

b. a substantially moisture impervious transparent goggle member in said mask at a location permitting the animal relatively unobstructed vision;

c. a head strap extending between said first and second sides at a location adjacent said goggle member; and

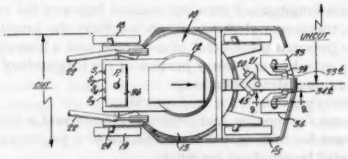
d. a jaw strap extending generally parallel to said third side whereby said straps can be respectively engaged about the animal's head and jaws to secure said device in place.

3,924,389

AUTOMATIC LAWN MOWER

Stanley B. Kita, 30 Valley Green Road, Doylestown, Pa. 18901

Filed Mar. 27, 1973, Ser. No. 345,307
Int. Cl.[2] A01D *35/262*
U.S. Cl. 56—10.2 **43 Claims**



1. In combination with a self-propelled vehicle having a power source; means connected to said power source for cutting a swath of vegetation projecting upwardly from the ground; means for steering the vehicle in response to a signal; and means for guiding a vehicle automatically along the swath in the absence of an operator, including sensor means carried on the vehicle for detecting the edge of the swath, circuit

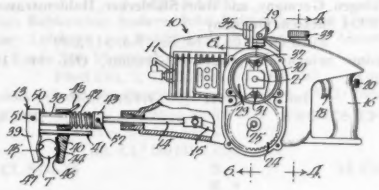
means connecting said sensor means and said steering means, a source of electrical energy connected in said circuit means and to said sensor means for passing electrical current through uncut vegetation, and amplifier means associated with said circuit means for producing the steering signal in response to said current, the improvement wherein said sensor means includes a plurality of electrical conductors having edges defining their peripheries with a portion of the periphery of one conductor being located adjacent a portion of the periphery of the other conductor and means mounting said conductors to said vehicle with an air gap surrounding their edges and disposed between said adjacent portions to insulate said conductors from said vehicle and from one another.

3,924,390

PORTABLE POWER-DRIVEN HARVESTING IMPLEMENT

Carl J. Alexander, Moore Park, Mich., assignor to Wells Manufacturing Corporation, Three Rivers, Mich.

Filed June 7, 1974, Ser. No. 477,432
Int. Cl.[2] A01D *46/00*
U.S. Cl. 56—328 TS **11 Claims**



11. A portable harvesting implement which comprises in combination

a housing;

a lightweight internal combustion engine situated in said housing and provided with a power output shaft;

a reduction gear means mounted in said housing and provided with an output shaft;

a centrifugal clutch means connecting said engine with said reduction gear means and adapted to engage the power output shaft of said engine with said reduction gear means when the engine has attained a predetermined number of revolutions per minute;

a rigid, elongated link member, having an inner end and an outer end, slidably mounted in said housing and projecting the outer end therefrom;

translational means for converting rotary motion of said reduction gear means output shaft to reciprocating motion connected between the inner end of said link member and said reduction gear means output shaft; and

spring-biased clamp means, adapted to engage a fruit-bearing tree or limb on the outer end of said link member and comprising an elongated stem affixed to said link member, a fixed jaw member fixedly mounted on the distal end of the stem substantially normal to the longitudinal axis thereof, a complementary movable jaw member slidably mounted on said stem, stop means positioned between said fixed jaw member and said movable jaw member for limiting forward movement of movable jaw member short of abutment with fixed jaw member, retainer means fixedly mounted on said stem for limiting the sliding movement of said movable jaw member, compression spring means slidably received on said stem between said movable jaw member and said retainer means and urging said movable jaw member toward said fixed jaw member, and a rearwardly-extending jaw alignment means mounted on said fixed jaw member spaced from said stem but substantially parallel thereto and slidably engaging said movable jaw member;

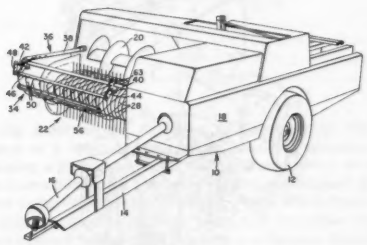
said jaw members being provided in opposing faces thereof with concave surfaces for receiving the tree or limb therebetween, and said surfaces being laterally spaced from said stem for a distance sufficient to cause binding between said movable jaw member and said stem when the tree or limb is held therebetween.

3,924,391

ADJUSTABLE CROP COMPRESSOR FOR A PICKUP MECHANISM

Leo George Cheatum, Ottumwa, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Mar. 3, 1975, Ser. No. 554,636
Int. Cl.[2] A01D *89/00*
U.S. Cl. 56—364 **6 Claims**



1. In a harvesting machine having a rotary pickup mechanism with a plurality of pickup elements adapted to raise crop material from a field as the machine advances and deliver it rearwardly onto a generally horizontal deck, the combination therewith of an improved crop compressor device for restraining the upward movement of the crop material as it is raised by the pickup mechanism and comprising; a supporting structure mounted on the harvesting machine and including a support member above the pickup mechanism; a pair of parallel support arms swingably mounted on the support member for swinging about a transverse axis; a transverse bar extending between and journaled in the support arms parallel to the pivot axis of the arms; a plurality of compressor tines mounted on and depending from the bar and including cantilevered, generally horizontal rearward portions disposed above the deck and resiliently deflectable upwardly to permit the rearward passage of crop material between the deck and the compressor tines, the tines engaging the crop material from above to compress the crop material downwardly toward the deck; means for adjustably positioning the arms in different angular positions about the transverse support member to selectively vary the position of the bar relative to the pickup mechanism; crank arm means connected to the bar; and linkage means interconnecting the crank arm means and the supporting structure to control the angular position of the bar in the support arms and thereby control the attitude of the compressor tines relative to the pickup mechanism.

3,924,392
APPARATUS FOR MOUNTING PORTABLE MANUALLY OPERATED YARN KNOTTER MECHANISMS ON YARN PROCESSING MACHINES

Gustav Franzen, Neersen Bezirk Dusseldorf, and Helmut Veltges, Krefeld, both of Germany, assignors to Palitex Project-Company G.m.b.H., Germany

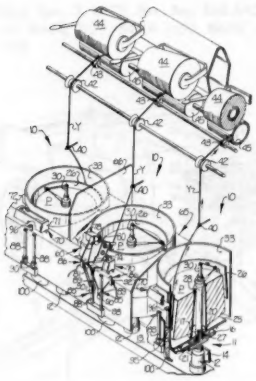
Filed July 5, 1973, Ser. No. 376,742

Claims priority, application Germany, July 12, 1972, 2234211

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] D01H *15/00*

U.S. Cl. 57—34 R **10 Claims**



1. In the combination of a textile yarn processing machine, such as a twister, spinning frame or the like, having a plurality of spindle assembly means positioned in side-by-side relationship for the processing of yarn, control means operatively connected with each of said spindle assembly means for selectively stopping and starting operation of said respective spindle assembly means, and a manually operated, portable yarn knotter mechanism for knotting together two ends of broken or otherwise separated yarn at selected spindle assembly locations; the improvement of

holder means mounted stationary on said yarn processing machine in front of each said spindle assembly means and including means for releasably receiving and mounting said yarn knotter mechanism at the desired knotting location in front of selected spindle assembly means for a yarn knotting operation at the selected spindle assembly means eliminating the necessity of the operator holding said portable yarn knotter mechanism and actuating means operatively connected with the respective control means and responsive to reception and mounting of said yarn knotter mechanism in said respective holder means for actuating said control means to stop operation of said respective spindle assembly means for a yarn knotting operation.

3,924,393
APPARATUS FOR PIECING A THREAD IN AN OPEN-END SPINNING UNIT

Fritz Stahlecker, Josef-Neidhart-Str. 18, D 7341 Bad Ueberkingen, and Hans Stahlecker, Haldenstrasse 20, D 7334 Suessen, both of Germany

Filed Oct. 10, 1974, Ser. No. 513,776

Claims priority, application Germany, Oct. 10, 1973, 2350842

Int. Cl.[2] D01H *7/00, 1/12, 15/00*

U.S. Cl. 57—34 R **25 Claims**

1. Apparatus for piecing a thread end in an open-end spinning unit having a spinning rotor with a ring of opened-up fibers comprising:

opening means including comb means for combing out the thread end,

and a device for returning the thread end into the spinning rotor after combing thereof by said comb means.

3,924,394
APPARATUS FOR PIECING A THREAD IN AN OPEN-END SPINNING UNIT

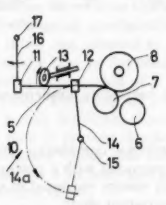
Fritz Stahlecker, Josef-Neidhart-Strasse 18, D 7341 Bad Ueberkingen, Germany, and Hans Stahlecker, Haldenstrasse 20, D 7334 Suessen, Germany

Filed Oct. 10, 1974, Ser. No. 513,849

Claims priority, application Germany, Oct. 10, 1973, 2350843

Int. Cl.[2] D01H *7/00, 1/12, 15/00*

U.S. Cl. 57—34 R **29 Claims**



1. Apparatus for piecing a thread end in an open-end spinning unit having a spinning rotor with a ring of opened-up fibers comprising:

opening means including friction tool means for fraying the thread end at a predetermined location,

and a device for returning the thread end into the spinning rotor after fraying thereof by the friction tool means.

3,924,395
THREAD SUCTION TUBE CONNECTION

Oscar Grossi, Bologna, Italy, assignor to Cogne Macchine Tessili-Cognetex S.p.A., Imola, Italy

Filed Dec. 14, 1973, Ser. No. 424,748

Claims priority, application Italy, Jan. 17, 1973, 47751/73

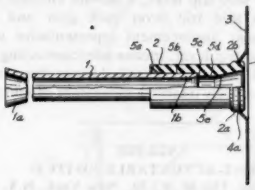
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] D01h *5/68*

U.S. Cl. 57—34.5 **2 Claims**

1. A thread suction tube and a tube carrier adapted for communicating with a suction channel of a spinning machine comprising in combination: a suction tube having an axial smooth bore with a flared inlet orifice and which is made of an antistatic rigid material, and a tube carrier shaped in the form of a sleeve and made of an elastically deformable material; said sleeve having an axial conduit comprising a flared end adapted to facilitate the insertion of the rear end of the suction tube and which has a radius forming a conical section, the diameter of the more restricted cross-sectional area is less than the outer diameter of the suction tube; said conical sec-

tion ending with an annular shoulder, the inner edge of which defines the entrance of a cylindrical section of said conduit, having a diameter substantially equal to the inner diameter of



the suction tube and having a flared end; and means being provided to sealingly connect the said tube carrier to an entrance orifice provided in the side wall of the suction channel.

3,924,396

COMPOSITE YARN FORMING METHOD AND APPARATUS

Emilian Bobkowicz; Andrew John Bobkowicz, and Margaret Mary Lefebvre, nee Bobkowicz, all of 1435 St. Alexander St., Room 310, Montreal, Quebec, Canada

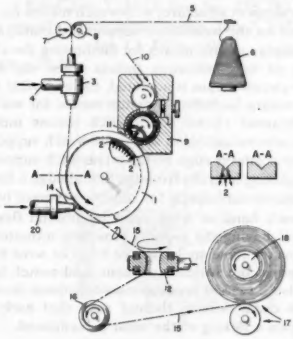
Filed Oct. 2, 1972, Ser. No. 294,103

Claims priority, application Canada, July 6, 1972, 146543

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] D01H *13/30, 1/12*

U.S. Cl. 57—35 **14 Claims**



5. Apparatus for producing composite spun yarn which comprises: a rotatable circumferentially grooved roll; means for simultaneously introducing into the groove of said roll three components, namely a carrier strand, a tacky polymer and staple fibers; tension control means through which said carrier filament passes before being directed into the groove of said roll; a spindle following said grooved roll through which the yarn coming out of the groove is passed, said spindle imparting a twist to said yarn which is transmitted back into the groove where the three components are thus twisted into spun yarn, said spindle being positioned at an angle with respect to said grooved roll such as to impart tension and force the strand in the groove against the bottom of said groove; at least one pulling device following said spindle to maintain the yarn under positive pull; and a wind-up arrangement for linearly winding the obtained composite spun yarn on a collecting roll.

3,924,397

APPARATUS FOR REMOVING IMPURITIES FROM FIBROUS MATERIAL

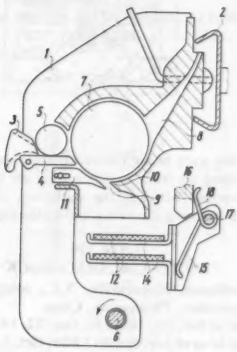
Fritz Stahlecker, Josef-Neidhart-Str. 18, D-7341 Bad Uberkingen, and Hans Stahlecker, Haldenstrasse 20, D-7334 Sussex, both of Germany

Filed Oct. 29, 1974, Ser. No. 518,900

Claims priority, application Germany, Nov. 9, 1973, 2356180

Int. Cl.[2] D01H *11/00, 1/12*

U.S. Cl. 57—56 **13 Claims**



1. An apparatus for separating fibrous material which is supplied to a spinning rotor of an open-end spinning unit, containing a path of travel for said separated fibres, in which there is an opening for removing impurities contained in said fibrous material, whereby conveying means which travel past said removal opening and take along said impurities are arranged beneath said removal opening at a distance therefrom, and whereby guide surfaces for the removed impurities are arranged between said removal opening and said conveying means.

3,924,398

METHOD OF AND APPARATUS FOR OPEN END SPINNING FROM STAPLE FIBERS

Miroslav Esser, Ceska Trebova; Zdenek Ledr; Frantisek Ferkl, both of Usti nad Orlici; Miloslav Kubovy, Dolni Dobrouc; Josef Ripka; Frantisek Hortlik, both of Usti nad Orlici, and Jiri Elias, Brandys nad Orlici, all of Czechoslovakia, assignors to Vyzkumny ustav bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed Oct. 24, 1974, Ser. No. 517,522

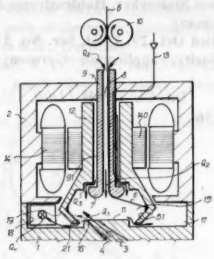
Claims priority, application Czechoslovakia, Oct. 24, 1973, 7307-73

Int. Cl.[2] D01H *1/12*

U.S. Cl. 57—58.89 **9 Claims**

3. In an apparatus for the open end spinning of yarn from staple fibers in a rotary underpressure spinning chamber mounted in an air lubricated bearing, said apparatus having a feeding channel for feeding fibers from a fiber opening mechanism merging into said spinning chamber through a stationary lid, and a yarn withdrawing element, in the form of a hollow pin passing through the hollow shaft of the spinning chamber with a predetermined clearance disposed opposite the lid of the spinning chamber engaging its front opening, and means for blowing lubricating air into said clearance, the improvement which comprises means joining with the inner space of the rotary underpressure spinning chamber three air flows, of which a first one is an air flow passing together with the fibers through the feeding channel, a second air flow is fed from the ambient atmosphere through the hollow pin for withdrawing yarn and the third air flow is fed through the clearance be-

tween the hollow pin and the hollow shaft of the spinning chamber, said air flows forming a resulting air flow inside the spinning chamber preventing fiber losses and the wrapping of



fibers about the yarn being formed therein and an outlet slot for said resulting air from said resulting air flow, said outlet slot being disposed between the stationary lid and the front margin of the spinning chamber and collecting space.

3,924,399

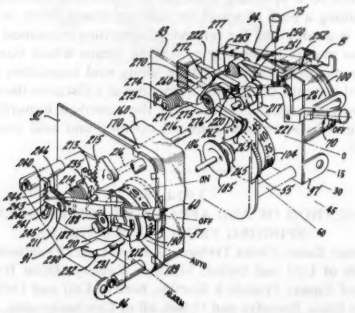
DIGITAL ALARM CLOCK

Ralph C. Robinson, Morresville, N.C., assignor to General Time Corporation, Thomaston, Conn.

Continuation of Ser. No. 100,836, Dec. 22, 1970, abandoned, which is a division of Ser. No. 863,886, Oct. 6, 1969, Pat. No. 3,597,918. This application Dec. 2, 1974, Ser. No. 528,659

Int. Cl.[2] G04B *23/02*; **G04C** *21/28*

U.S. Cl. 58—16 D **6 Claims**



1. In a digitally indicating clock, the combination comprising a plurality of endless loops of tape arranged side by side carrying cycles of numerals respectively representative of minutes, tens-of-minutes and hours in successive orders, means including a front panel having a viewing area for viewing said cycles of numerals, the tapes having respective drums for driving the same, geneva mechanisms interposed between the adjacent drums, a seconds drum having seconds indicia on the periphery thereof, a motor and first drive train for driving the seconds drum, a geneva mechanism interposed between the seconds drum and minutes drum for periodic stepped advancement of the latter, an hour wheel, an hour wheel drive train, an alarm set wheel adjacent the hour wheel, said hour wheel and said alarm set wheel having cooperating cams for producing relative endwise movement when the wheels come into a predetermined condition of register, said hour wheel drive train being coupled to the minutes drum for periodic advancement of the hour wheel, and means responsive to the relative endwise movement of the wheels for controlling the operation of apparatus from an "off" condition selectively and sequentially to conditions of "auto-on" and "alarm," said means including a trip lever, said trip lever being pivotally mounted adjacent the wheels for cooperable endwise movement with the wheels, means biasing said trip lever in one direction about said pivot point, means in the path of said trip lever for limiting biased pivotal movement of said trip lever in response to the relative endwise movement of the wheels, a circular rack on said trip lever, a second circular rack gear cooperable with said trip lever rack gear and rotatable through an angular displacement representative of pivotal movement of said trip lever, means interconnecting said second circular rack gear and controlled apparatus, and a function lever for selectively disabling movement of said trip lever.

3,924,400

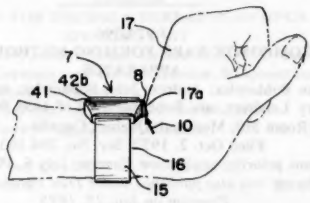
WRIST-ACTUATABLE SWITCH

Eugene R. Carlone, 150 W. 82 St., New York, N.Y. 10024

Filed Jan. 22, 1975, Ser. No. 543,080

Int. Cl.[2] G04B *19/30*

U.S. Cl. 58—50 R **3 Claims**



1. A wristwatch switch device comprising in combination: a wristwatch support structure, wristwatch means for keeping time mounted on the wristwatch support structure, and electrical time-display circuit means for facilitating the observing and reading of time-indicating indicia when the electrical time-display circuit means is actuated, the electrical time-display circuit means including a switch means for making and breaking electrical circuit, the switch means including a switch lever arm mounted on said wrist-watch support structure adjacent a lateral edge of the wristwatch support structure and projecting laterally from the lateral edge a first predetermined distance sufficiently for actuation thereof by contact with a person's hand or wrist upon intentional flexing of a person's hand having the support structure mounted on the wrist adjacent the hand such that the hand or wrist is thereby pressable against the switch lever arm, said switch lever arm projecting also a second predetermined distance downwardly at at-least a distal portion thereof such that early contact therewith upon a flexing of the wrist is facilitated.

3,924,401

TORSION PENDULUM CLOCK

Egon Heim, Sagedobel, 774 Triberg, Black Forest, Germany

Filed Mar. 21, 1974, Ser. No. 453,358

Claims priority, application Germany, Mar. 28, 1973, 2315431

Int. Cl. G04b *37/12*

U.S. Cl. 58—152 R **4 Claims**

1. A torsion pendulum clock comprising

a. a base portion,

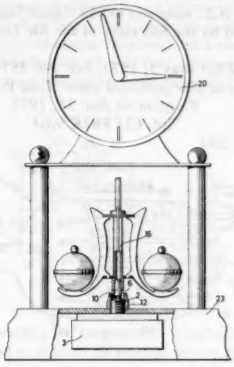
b. a housing on said base portion,

c. a support pin having journaled engagement in said housing in vertical relation with an upper portion thereof projecting above said housing,

d. drive means in said housing driving said pin rotatably in alternate directions in a torsion pendulum movement,

e. an ornamental pendulum seated on the projecting end of said pin and being rotatable with said pin in said torsion pendulum movement,

f. and a clockwork mounted on said base portion above said pendulum for displaying time,



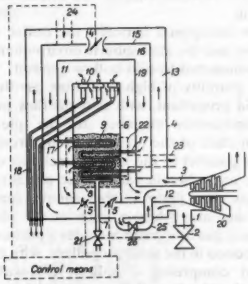
g. said clockwork having drive means therefor independent of said drive means for said pin.

3,924,402

COMBUSTION CHAMBER FOR GAS TURBINES AND THE LIKE HAVING A FLUIDIZED BURNER BED

Henrik Harboe, Kingston, England, assignor to Stal Laval Turbin AB, Finspong, Sweden

Filed July 2, 1973, Ser. No. 375,781
Claims priority, application Sweden, July 7, 1972, 8983/72
Int. Cl. F02c *1/00*
U.S. Cl. 60—39.18 C **9 Claims**



1. A combustion chamber for operating gas turbines and the like; comprising:

a. a burner housing;

b. a fluidized bed of particulate material within said burner housing;

c. means for purging the combustion gas from said burner housing;

d. a chamber surrounding said burner housing for receiving purged combustion gas from said burner;

e. means for injecting fuel into said burner;

f. means for introducing combustion air into said burner;

g. a cooling chamber for receiving a cooling medium surrounding the purged combustion gas chamber;

h. means for introducing a cooling medium into said cooling chamber;

i. means for passing said cooling medium in a confined path through said fluidized bed in heat relationship therewith;

j. means for passing said cooling medium and said purged combustion gas to a power out-put station, and

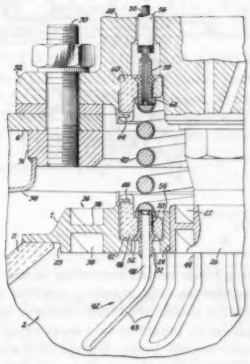
k. means for maintaining a predetermined proportional relationship between combustion air and said cooling medium constant regardless of varying power out-put demands and to maintain the fluidized bed temperature within a predetermined range.

3,924,403

COMBUSTION LINER SPRING SUPPORT USED FOR HOT WIRE IGNITER CIRCUIT

John A. Irwin, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 24, 1974, Ser. No. 517,806
Int. Cl.² F02C *7/20;* **F02G** *3/00;* **F02C** *7/26*
U.S. Cl. 60—39.32 **3 Claims**



1. A combustion apparatus for a gas turbine engine or the like comprising, in combination, a casing adapted to receive air under pressure; a combustion liner mounted within the casing defining a reaction zone; a fuel nozzle extending from the casing into the liner; the liner including a conductive support ing disposed about the nozzle and grounded to the casing through the nozzle; means for mounting the liner within the casing including a compression spring extending from the casing to the liner around the fuel nozzle; an ignition current lead extending through the casing into contact with the spring, the lead and spring being insulated from the casing and the support ring; hot wire means for fuel ignition disposed adjacent to the fuel nozzle, the hot wire means having one end grounded to the support ring and one end insulated from the support ring and connected to the spring.

3,924,404

APPARATUS FOR ADJUSTING FAN BLADES IN A TURBOJET ENGINE

Wolfgang Pollert, Herbertshausen, Germany, assignor to Motoren- und Turbinen-Union Munchen GmbH, Germany

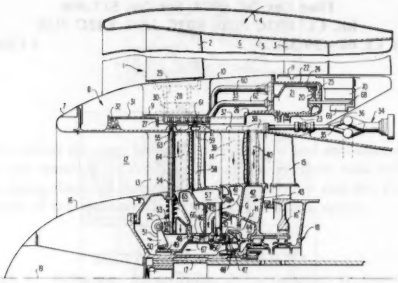
Filed Apr. 19, 1973, Ser. No. 353,387
Claims priority, application Germany, Apr. 19, 1972, 2218874
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² F02C *3/06;* **F01D** *7/00*
U.S. Cl. 60—226 R **16 Claims**

1. Apparatus for adjusting fan blades in a turbojet engine of ducted-fan construction of the type which has primary and secondary ducts; said apparatus comprising:

drive system and actuating mechanism means positioned substantially inside of an annulus arranged between said primary and secondary ducts and including a piston con-

nected to toothed rack means mounted for movement within said annulus, said fan blades including blade teeth which matingly engage corresponding rack teeth of said toothed rack means,

selectively engageable arresting means engageable with said toothed rack means to prevent movement of said toothed rack means,



and supporting blade means extending across said primary duct for supporting said annulus, wherein said arresting means includes resiliently biased plunger means extending through cavity means in said supporting blade means, said plunger means being engageable with respective spaced slots in said toothed rack means for arresting said toothed rack means in positions corresponding to predetermined adjusted positions of said fan blades.

3,924,405

SOLID PROPELLANTS WITH STABILITY ENHANCED ADDITIVES OF PARTICULATE REFRACTORY CARBIDES OR OXIDES

Joseph Cohen, and Gilbert A. Zimmerman, both of Sacramento, Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

Filed June 7, 1973, Ser. No. 360,867

Int. Cl.[2] C06D *5/06*

U.S. Cl. 60—219 **14 Claims**

1. A stable burning, solid propellant composition absent visible smoke on burning comprising a cured, intimate mixture of:

a major amount of solid inorganic oxidizing salt;

a minor amount of a combustible synthetic, organic elastomeric hydrocarbon resin formed by the chain extension and cross-linking of functionally-terminated, liquid butadiene polymers; and

0.2 to 5% by weight of the composition of a stability enhancing additive consisting essentially of the combination of:

1. an oxide or carbide having a melting point of at least about 2000°C selected from the group consisting of thorium, tungsten, silicon, molybdenum, aluminum, hafnium, zirconium and vanadium oxides and carbides; and

2. particulate carbon.

12. A method for producing thrust in the absence of visible smoke comprising the steps of:

burning a solid propellant composition defined according to claim **1** at a burning rate above about 0.4 in/sec without combustion instability at pressures of at least 1000 psia so as to produce non-smoking combustion gases; and

exhausting said gases through an orifice to produce thrust.

3,924,406

EMBEDDED POROUS ELEMENT ROCKET MOTOR

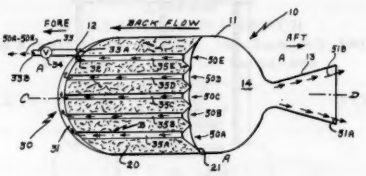
Leonard H. Caveny, Trenton, N.J., and Martin Summerfield, Princeton, N.J., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 3, 1973, Ser. No. 357,039

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] F02K *9/04*

U.S. Cl. 60—254 **3 Claims**



1. An apparatus for controlling the rate of burning of an end-burning solid propellant of a solid propellant rocket motor, wherein said rocket motor is in an atmospheric environment and wherein the rocket motor includes a casing having a fore end and an aft end, and also wherein the rocket motor has an end-burning solid propellant in the casing, a combustion chamber which is disposed aft of the end-burning solid propellant, and a nozzle which is disposed aft of the combustion chamber, and further wherein the end-burning solid propellant has a longitudinal axis, comprising:

a. a plenum chamber disposed in the fore end of the rocket motor casing and forward of the solid propellant, with said plenum chamber having an outlet;

b. a hollow conduit having two ends, with one end connected to the outlet of said plenum chamber, and with the other end exposed to, and within, the atmospheric environment;

c. a valve interposed between the outlet of said plenum chamber and the atmospheric environment, and with said valve connected to said hollow conduit;

d. and, a plurality of high-resistance gas flow paths within the solid propellant, with said gas flow paths connecting the combustion chamber to the plenum chamber, wherein each of the plurality of high-resistance gas flow paths is parallel to the longitudinal axis of the solid propellant, and wherein each of the plurality of high-resistance gas flow paths is also equally spaced from each other, and also wherein each of the plurality of high-resistance gas flow paths includes a porous element which is embedded in the solid propellant, with each said porous element comprising a hollow, thin-walled, cylindrical plastic sheath of small diameter which contains therein a suitable gas flow-restricting, porous, filler material, said filler material being an active packing of reactive material.

3,924,407

EXHAUST EMISSION CONTROL DEVICE

Yukio Hosho, Katsuta; Yoshishige Oyama, Hitachi, and Kimiji Karino, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 16, 1973, Ser. No. 406,956

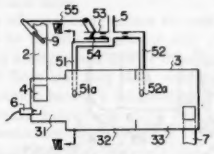
Claims priority, application Japan, Oct. 20, 1972, 47-104474

Int. Cl.[2] F01N *3/10*

U.S. Cl. 60—284 **1 Claim**

1. An exhaust emission control device for rendering noxious exhaust gases from an engine clean by supplying air thereto and subjecting them to recombustion, comprising an exhaust emission pulsation reducing means disposed mediately in a passage of an exhaust emission introduced from the engine to

recombustion means for throttling the exhaust gases flowing through said passage when the engine is started and while it is being warmed up, and for enlarging the cross-sectional area of the passage when the engine operates at higher speeds, wherein recombustion is effected in an afterburner comprising a precombustion chamber, a first combustion chamber downstream of said precombustion chamber, and a second combustion chamber downstream of said first combustion chamber with passage means connected with said first and second



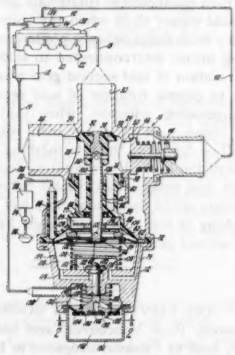
combustion chambers for tangentially introducing secondary air thereinto, said secondary air passage means being provided with valve means for controlling the supply of air to said first and second combustion chambers operatively connected with said throttling means such that when the emission gases to the afterburner are being throttled when the engine is started and being warmed up the secondary air valve means is closed so as to supply a relatively large volume of secondary air to said first and second combustion chambers.

3,924,408

DIVERTER VALVE AND PRESSURE REGULATOR ASSEMBLY

David W. Beiswenger; Gordon R. Paddock, both of Rochester, N.Y., and Ernst L. Ranft, Rochester, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 31, 1974, Ser. No. 519,530
Int. Cl.² F02B *75/10*
U.S. Cl. 60—290 **2 Claims**



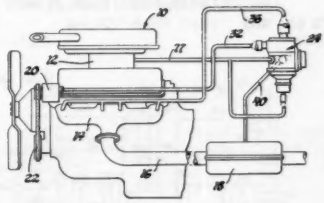
1. A diverter valve and pressure regulator assembly for use on an internal combustion engine having an exhaust system, an air pump, and an auxiliary pneumatic device, said assembly comprising a housing having an inlet adapted to receive air from said pump, an outlet adapted to discharge air to said exhaust system, and a valve seat intermediate said inlet and said outlet, a diverter valve member associated with said valve seat, a spring biasing said diverter valve member toward said valve seat to restrict air flow from said inlet to said outlet, and a diaphragm secured to said housing to define a regulated pressure chamber therebetween, a passage extending from said inlet to said chamber to supply air thereto, said chamber being adapted for connection to said device to supply air thereto, said diaphragm being connected to said diverter valve member and responsive to the pressure in said regulated pressure chamber to shift said diverter valve member away from said valve seat against the bias of said spring when the pressure in said chamber exceeds a predetermined minimum and to permit said spring to shift said diverter valve member toward said valve seat when the pressure in said chamber drops below said minimum whereby air flow through said outlet is restricted to charge said regulated pressure chamber and said device to said minimum pressure, and which further comprises means responsive to engine operating conditions for equalizing the pressures across said actuating diaphragm to permit said spring to shift said diverter valve member toward said valve seat whereby air flow through said outlet to said exhaust system is restricted.

3,924,409

ENGINE SECONDARY AIR FLOW CONTROL VALVE

Gerald D. Heilman; Gordon R. Paddock, both of Rochester, N.Y., and Ernst L. Ranft, Rochester, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 22, 1974, Ser. No. 526,380
Int. Cl.² F02B *75/10*
U.S. Cl. 60—290 **3 Claims**



1. An air control valve for use with an internal combustion engine having an air induction system for supplying air to the engine and generating an engine induction vacuum signal, an exhaust system for exhaust gas flow from the engine, a catalytic converter in the exhaust system for promoting oxidation of exhaust gas constituents and an air supply system including an air pump and having a first branch for delivering air to the exhaust system at a point upstream and remote from the catalytic converter and a second branch for delivering air to the catalytic converter, the air control valve comprising, in combination:

a valve body defining a valve chamber having an inlet connected to the air pump, a first outlet connected to the first branch, a second outlet connected to the second branch and a third outlet openable to the atmosphere by a pressure relief valve, the valve body further including a pair of axially opposed valve seats in the valve chamber surrounding the first and second outlets; a stem projecting coaxially through the valve seats and valve chamber; first and second valve members slidably disposed on the stem; a spring compressed between the first and second valve members to normally bias the first valve member against the first valve seat to close the first outlet and bias the second valve member against the second valve seat to close the second outlet; an expansible chamber motor comprising a movable wall defining first and second motor chambers in the valve body, the movable wall being responsive to the pressure difference thereacross to assume a central position when the pressure difference is zero and move in one or the other direction from the central position when air pressure in the first motor chamber exceeds that in the second motor chamber or the air pressure in the second motor chamber exceeds

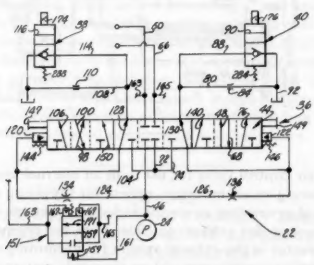
that in the first motor chamber, respectively, the movable wall further having the stem attached thereto for co-movement, the stem having a first stop effective to engage the first valve member and open the first outlet with movement of the movable wall in the one direction from its central position and a second stop effective to engage the second valve member and open the second outlet with movement of the movable wall in the other direction from its central position; a restricted flow orifice in the valve body opening the first motor chamber to the atmosphere; a valved conduit in the valve body opening the first motor chamber to the valve chamber; a conduit in the stem opening the second motor chamber to the valve chamber; a valved opening in the valve body opening the second motor chamber to the atmosphere; a first actuator responsive to a first signal to close the valved conduit and responsive to a second signal to open the valved conduit; and a second actuator responsive to the engine induction vacuum signal to open the valved opening below a high vacuum signal level and close the valved opening above the high level.

3,924,410

HYDROSTATIC TRANSMISSION CONTROL SYSTEM

Charles R. Cornell; Dennis D. Simpson, and Kenneth K. Knapp, all of Battle Creek, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Oct. 2, 1974, Ser. No. 511,212
Int. Cl.[2] F15B *20/00*; F16H *39/46*
U.S. Cl. 60—403 **32 Claims**



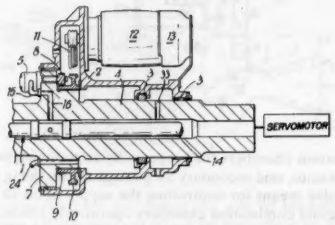
1. An apparatus comprising a hydrostatic transmission including a pump unit connected in fluid communication with a motor unit, actuator means for varying the displacement of one of said units, main control valve means for porting fluid to effect operation of said actuator means to vary the displacement of said one unit of said hydrostatic transmission, said main control valve means being operable from a neutral condition to a first condition to effect operation of said actuator means to increase the displacement of said one unit of said hydrostatic transmission and being operable from the neutral condition to a second condition to effect operation of said actuator means to decrease the displacement of said one unit of said hydrostatic transmission, first pilot valve means for effecting operation of said main control valve means from the neutral condition to the first condition and for effecting a variation in the rate at which fluid is ported by said main control valve means independently of said main control valve means when said main control valve means is in the second condition to thereby effect a variation in the rate at which said actuator means decreases the displacement of said one unit of said hydrostatic transmission, and second pilot valve means for effecting operation of said main control valve means from the neutral condition to the second condition and for effecting a variation in the rate at which fluid is ported by said main control valve means independently of said main control valve means when said main control valve means is in the first condition to thereby effect a variation in the rate at which said actuator means increases the displacement of said one unit of said hydrostatic transmission.

3,924,411

OIL-SUPPLY MEANS FOR RUNNER HUBS WITH CONTROLLABLE PITCH BLADES

Eric R. May, Kent, England, assignor to Stone Manganese Marine Limited, London, England

Filed Mar. 21, 1973, Ser. No. 343,311
Int. Cl.[2] F16D *31/00*
U.S. Cl. 60—486 **6 Claims**



1. An apparatus for supplying pressurized hydraulic fluid to the interior of a rotating shaft, comprising in combination:

a. a rotatable shaft having an interior fluid passageway, an inlet fluid duct connecting the exterior of said shaft with said interior fluid passageway, and a servomotor means connected to said passageway,

b. at least two pumps for pumping hydraulic fluid through said inlet duct,

c. each pump being mounted on an external portion of said rotary shaft so that when the rotary shaft rotates each pump will rotate with it,

d. each pump being driven by the engagement of a first gear means, which is integrally connected with the pump, with a second gear means, which is mounted concentrically and separately with respect to said rotatable shaft,

e. said second gear means being interconnected to a drive means which is adapted to rotate said second gear means around said rotary shaft when the speed of rotation of said rotary shaft drops below a predetermined value, and

f. braking means interconnected to said drive means to prevent rotation of said second gear means when operative and to permit rotation of said second gear means when inoperative, whereby, when said rotary shaft is rotating above said predetermined rotary speed each pump will be driven by the intermeshing of said first gear means with the braked non-rotating second gear means and when said rotary shaft rotates below said predetermined rotary speed then each pump will be driven by the intermeshing of said first gear means with the unbraked rotating second gear means.

3,924,412

OIL CONTAINMENT BOOM

John A. Bennett, West Vancouver, and Ian R. McAllister, Vancouver, both of Canada, assignors to Bennett Pollution Controls, Ltd., North Vancouver, Canada

Continuation-in-part of Ser. No. 541,260, Jan. 15, 1975, which is a continuation of Ser. No. 464,539, April 26, 1974, abandoned. This application Mar. 3, 1975, Ser. No. 554,979
Int. Cl.[2] E02B *15/04*
U.S. Cl. 61—1 F **12 Claims**

1. A containment boom comprising:

a. an elongate, generally planar, flexible skirt adapted to be positioned in a body of water at the surface thereof with a longitudinal axis of the skirt being generally parallel to the water surface, and with an upper lateral edge of the skirt being above the water surface and a lower lateral

edge of the skirt being below the water surface, said skirt having sufficient strength and being arranged to be a primary load carrying member with respect to tensile forces along the length of the boom, with said skirt thus being subjected to moderate elongation under tensile loading;

b. a plurality of floats adapted to be mounted to said skirt at spaced intervals along the length of the skirt, each of said floats having an outer exposed surface and a generally flat inner mounting surface adapted to fit against a surface of said skirt;

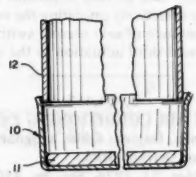
c. a plurality of connecting means for said floats to connect the floats to the skirt, each of said connecting means comprising a tongue and groove interconnection between its related float and said skirt, said tongue and groove interconnection having a longitudinal engaging axis permitting limited movement along said axis between connecting portions of the skirt and float, whereby moderate elongation of said skirt does not cause substantial stress at the area of the connection between the float and the skirt, and

d. stop means arranged to engage said floats so as to limit longitudinal movement thereof relative to the skirt and thus maintain the floats in proper position.

3,924,413
FITTINGS AND THE LIKE FOR PIPE PILING

Richard O. Marsh, Jr., 701 Standard Life Bldg., Pittsburgh, Pa. 15222

Filed Dec. 4, 1973, Ser. No. 421,736
Int. Cl.² E02D *5/00, 5/72;* **F16L** *25/00*
U.S. Cl. 61—53 **21 Claims**



1. The combination with a section of pipe piling of a fitting attached to said section of pipe piling, said fitting comprising a metal sleeve having a circular section the inner diameter of which tapers to a minimum diameter less than the outer diameter of the pipe piling, said pipe piling being stronger then said circular section whereby the fitting is expanded over the piling without deforming it when the piling is driven thereinto, to provide a watertight metal-to-metal seal on the pipe piling.

3,924,414
PILE FOR USE IN OFFSHORE AREAS HAVING A SHIFTING LAYER OF MUD

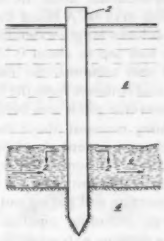
George P. Maly, Newport Beach, Calif., and Clifton A. Tannahill, Houston, Tex., assignors to Union Oil Company of California, Brea, Calif.

Filed Aug. 22, 1974, Ser. No. 499,650
Int. Cl.² E02D *5/22*
U.S. Cl. 61—53 **7 Claims**

1. A pile for use in offshore areas having a layer of mud susceptible to movement overlaying a competent bottom, which comprises:

an elongated tubular member driven through a mud layer susceptible to movement and imbedded in the underlying competent bottom so as to extend upwardly through said mud layer; and

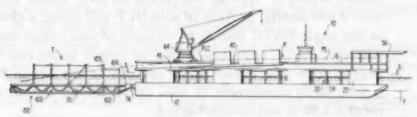
fluid ejection means for ejecting fluid outwardly from the interior of said tubular member at a plurality of locations all of which are above said competent bottom and substantially within said mud layer; and for fluidizing the mud adjacent to the pile



3,924,415
COLUMN STABILIZED SEMISUBMERSIBLE PIPELAYING BARGE

Yoram Goren, Los Angeles, and Charles N. Springett, Irvine, both of Calif., assignors to Santa Fe International Corporation, Orange, Calif.

Filed Dec. 30, 1974, Ser. No. 537,784
Int. Cl.² B63B *35/04*
U.S. Cl. 61—72.3 **93 Claims**



1. A column stabilized semi-submersible pipe-laying barge and pipeline transition combination comprising:

a pair of elongated hulls disposed in spaced side by side relation with each hull having substantially parallel substantially planar top and bottom surfaces disposed substantially horizontal and perpendicular to a vertical plane through the longitudinal centerline of the barge and extending substantially the length of each hull, with the transverse horizontal dimension of each hull being greater than its vertical dimension;

a working platform spaced above said hulls a predetermined height;

means for supporting said platform in fixed spaced relation above said hulls including at least three columns connecting with each of said hulls and said platform and located at spaced intervals along said hulls;

the distance between the extremities of said barge along the barge's longitudinal centerline being substantially greater than the distance between the extremities of said barge along the barge's transverse centerline, with the ratio of BLH to BWH being at least 2.5 to 1 and the ratio of BLP to BWP being at least 2.5 to 1.

at least one column on each hull being located adjacent the stern end of said barge, another of said columns on each hull being located adjacent the opposite end of the barge, with at least one additional column at an intermediate position on each hull;

a plurality of longitudinally spaced structural means reinforcing the structural relationship of the hulls, platform and columns;

said hulls having ballast compartments and said barge including means for ballasting the barge to alter its draft between a low draft hull supported floating condition with the hulls having freeboard and a high draft semi-sub-

merged column stabilized floating pipelaying operating condition;

each of said columns having a height BCH and predetermined cross-sectional areas BCA, with each column's cross-sectional area BCA being the same for at least that part of the column length extending between about 0.25 BCH above hull top to about 0.75 BCH above hull top; the area of said columns, the number thereof and the distance of said columns from the barge's longitudinal roll axis and transverse pitch axis being such as to provide a greater righting moment about the transverse pitch axis than the righting moment about the longitudinal roll axis when said barge is in semi-submerged high draft pipelaying operating condition;

means for supporting and paying out pipeline from one end of said barge including pipeline transition means for supporting a pipeline extending from said barge end into the water;

means including said pipeline transition means for controlling the curvature of a segment of the pipeline extending from said barge end and over said pipeline transition means;

crane means carried by said barge with means for moving said crane means substantially longitudinally of the barge along most of said platform length BLP from near the aforesaid barge end to near the opposite barge end; said crane means including means for lifting transferring and setting loads and being of a size, weight and capacity such that total crane means load CL and its locus LC in relation to barge trim axis TA at beginning, during and cessation of movement of said crane means cause resultant moment CLM about the barge trim axis TA of such magnitude whereby typical operation of said crane means over a substantial portion of said BLP will cause a change in the angle BATC due to movement of said crane means whereby BATC will exceed plus or minus about one-half degree from the preset angle of trim of the barge PAT before such movement of said crane means if said moment CLM is not counteracted;

said ballast means being operable to preset said barge trim angle PAT between predetermined angular limits;

said ballast means also being operable between beginning and cessation of movement of said crane means as above stated to maintain the barge angle of trim change CMIT less than plus or minus one-half degree variation from said preset barge trim angle PAT;

said barge having columns of such height BCH and said means for ballasting the vessel in semi-submerged condition being operable so that the load line draft of the barge LLD in relation to barge column height BCH is within the limits of envelope curves A and B of FIG. 13 of this application.

3,924,416

REFRIGERATOR CONTROL APPARATUS

Peter Robert Durdin, New Malden, England, assignor to AMF Incorporated, White Plains, N.Y.

Filed Aug. 20, 1974, Ser. No. 499,091

Claims priority, application United Kingdom, Sept. 11, 1973, 42762/73

Int. Cl.² F25D *21/00*

U.S. Cl. 62—80 **15 Claims**

1. In apparatus for controlling the defrosting of a refrigeration system which includes a compressor, fan, and heater, the combination comprising

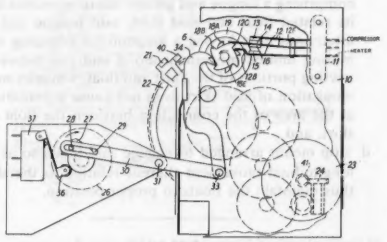
control means for independently and selectively controlling said compressor, fan and heater,

actuating means for selectively actuating said control means,

means for initiating operation of said actuating means upon occurrence of an event, thereby to initiate a defrosting cycle of said refrigeration system,

said actuating means and said control means being constructed and arranged to turn off said compressor and fan and turn on said heater upon a first actuation by the initiating means in a defrosting cycle of operation, to turn on said compressor and turn off said heater at a second actuation, and to turn on said fan at a later third actuation thereof,

a temperature sensing-switching circuit for sensing temperature in a part of said refrigeration system and for providing a first switching function when a predetermined maximum defrosting temperature is sensed and for providing



a second switching function when a predetermined lower temperature is sensed,

motor means selectively operable in response to said temperature sensing-switching circuit for operating said actuating means, and

means for further selectively operating the motor means only during the existence of said first switching function to provide only said second actuation to the actuating means and for selectively operating the motor means only during the existence of said second switching function to provide only said third actuation to the actuating means.

3,924,417

VEHICLE AIR CONDITIONING CONTROL

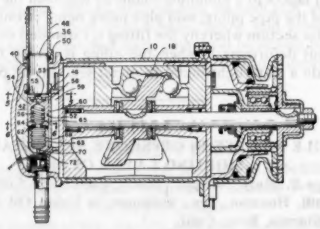
John Henry Heidorn, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 13, 1974, Ser. No. 450,546

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² F25B *41/04*

U.S. Cl. 62—158 **5 Claims**



1. A vehicle air conditioning system including a refrigerant compressor connected in series flow relation with a condenser, expansion means, and an evaporator; said compressor having a housing defining inlet and discharge passages; the system having an improved evaporator control assembly comprising: a valve body member exposed to both inlet and discharge refrigerant fluids in said housing; a throttle valve in said body member regulating flow of inlet fluids to said compressor through a throttle port; said throttle valve being exposed to inlet refrigerant fluids on one side; the other side

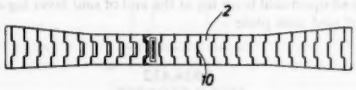
partially defining a control chamber and being subjected to a control pressure therein; means normally biasing said throttle valve to a compressor closed inlet position; said valve body containing bleed port connecting said chamber with said inlet passage; a control valve in said control chamber movable in response to the pressure therein to open and close said bleed port changing the pressure differential across said throttle valve whereby it moves opening and closing said throttle port maintaining a predetermined desired control pressure in said chamber and in said evaporator preventing freezing of said evaporator during normal conditions; a pressure responsive control valve actuator plunger in said compressor discharge passages sensing refrigerant pressure increases in evaporator loading above the control pressure established by said control valve; an increase in evaporator loading reflected by an increase in compressor discharge pressure moving said plunger opening said control valve and lowering the control pressure in said control chamber; said throttle valve moving opening said throttling passage thereby increasing cooling capacity of the system while the discharge pressure remains above the predetermined control pressure; and electrical control means connected to said control valve being selectively operable to likewise open said control valve providing increased system cooling capacity as desired.

3,924,418

LINK BRACELET CONSTRUCTION, PARTICULARLY WATCH BRACELET

Fritz Bürkle, Jr., Schwann, Germany, assignor to Firma Fritz Bürkle KG, Schwann, Germany

Filed May 20, 1974, Ser. No. 471,666
Int. Cl.² F16G *13/18*
U.S. Cl. 63—4 **10 Claims**



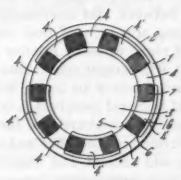
1. Link bracelet construction comprising
an inner element **1** and an outer element **2,**
the inner element **1** being essentially flat and platelike and having one transverse edge **3** formed with a notch **4,** and inwardly extending hinge pin stubs **5** adjacent said one transverse edge **3;**
the outer element **2** being sheet-like and having a bent-over ear **10** at one transverse side, the ear **10** having a width fitting into the notch **4** of an inner element **1** and engaging around the hinge pin stubs **5** to provide a link connection between the inner and outer elements of adjacent links at one side thereof, the outer element being formed with a notch **8** at the side thereof opposite the side at which the ear **10** is formed to receive the bent-over ear of an adjacent outer element, portions of the outer element adjacent said notch **8** forming flaps, said flaps being bent-over in U- configuration to form a slot between the legs of the U, the inner element **1** being located in said slot formed by said flaps; and
a connecting element **16–19; 13,** said connecting element **13** having a hook-shaped free end **14** and a width less than the width of the notches **4, 8** in the inner and outer elements **1, 2** to permit engagement thereof and hooking over said inner and outer elements.

3,924,419

FLEXIBLE JAW CLUTCH COUPLING

Harald H. Barth, Hermannstrasse 103, 663 Neunkirchen, Saar, Germany

Filed Apr. 11, 1973, Ser. No. 350,143
Claims priority, application Luxembourg, June 12, 1972, 65497
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² F16D *3/64*
U.S. Cl. 64—14 **11 Claims**



1. A flexible coupling including:
a pair of opposed interengaged coupling halves, each of said pair of opposed coupling halves having:
a. a cylindrical outer housing having an end face;
b. a cylindrical attachment within said outer housing; and
c. a plurality of claws evenly distributed over the circumference of the coupling half and extending beyond the cylindrical housing of the coupling half into the other coupling half;
the end faces of said cylindrical housings being spaced apart in the assembled state of said coupling;
the cylindrical attachment of each coupling half extending toward the other coupling half for an axial distance less than the cylindrical housing of the coupling half;
the flanks of each claw being concave and joining concave radially inwardly and outwardly extending surfaces at the roots of the claw to define a pocket between adjacent teeth in a coupling half to receive teeth from the other coupling half, the pocket having radial extending end portions defined by said radially inwardly and outwardly extending surfaces;
the radial dimension of the pockets between the cylindrical attachment and the outer housing in each coupling half being greater than the radial dimensions of the claws extending into the coupling half from the other coupling half; and
a molded part of elastic material positioned between successive claws from each of the coupling halves, said molded part having shaped pieces with convex sides between opposite concave flanks of successive claws and bridging parts alternately connecting opposite end faces of adjacent shaped parts, said shaped pieces, when not transmitting a load, having a radial dimension less than the radial dimension of the pockets, and said shaped pieces being free to expand radially inward and outward when transmitting a load; and
said radial extending end portions of said pocket providing contact surfaces for said shaped pieces when said coupling halves are radially offset or angle with respect to each other.

3,924,420

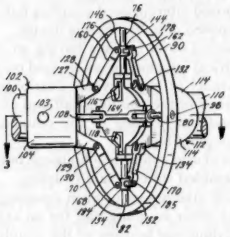
HIGH DEFLECTION CONSTANT SPEED UNIVERSAL JOINT

James B. Falk, 3 Lake James, St. Louis, Mo. 63034

Filed Apr. 12, 1974, Ser. No. 460,434
Int. Cl.² F16D *3/30*
U.S. Cl. 64—21 **18 Claims**

1. A substantially constant-speed universal joint which can provide balanced torque and which comprises an end member

with a torque-transmitting arm thereon that lies in a first plane, a second end member with a torque-transmitting arm thereon that lies in a second plane, an intermediate member which is disposed intermediate said end members and which coacts with said torque-transmitting arm on the first said end member and which also coacts with said torque-transmitting arm on said second end member to transmit torque from one of said end members to the other of said end members and also to hold said second plane angularly displaced from said first plane, interacting surfaces on said intermediate member and on said torque-transmitting arm on said first said end member which provide a swinging and sliding torque-transmitting connection between said intermediate member and said torque-transmitting arm on said first said end member that permits said first plane to swing relative to said intermediate member and that also permits said torque-transmitting arm on said first said end member to rotate within said first plane while said one of said end members is transmitting torque to said other of said end members, and further interacting surfaces on said intermediate member and on said torque-transmitting arm on said second end member which provide a swinging and sliding engagement between said intermediate member and said torque-transmitting arm on said second end



member that permits said second plane to swing relative to said intermediate member and that also permits said torque-transmitting arm on said second end member to rotate within said second plane while said one of said end members is transmitting torque to said other of said end members, centering means connected to said intermediate member and to each of said end members to hold said intermediate member so it divides the supplement of any angle of deflection between the axes of said first said and said second end members, said centering means including a plurality of sliding elements and a plurality of connecting members and a plurality of pivots, each of said connecting members being connected to one of said sliding elements and to an end element by a pivot at each end thereof, whereby said connecting members remain substantially free of bending moments while said one of said end members is transmitting torque to said other of said end members, said intermediate member having a plurality of elements which help define a third plane that is angularly displaced from both said first said and said second planes, said plurality of elements always being substantially coplanar, said plurality of elements including some of the first said interacting surfaces and some of said further interacting surfaces and guiding elements for said sliding elements of said centering means.

3,924,421

OVERLOAD CLUTCH

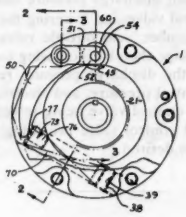
Wilfried E. Dehne, Berwyn, and Josef Mang, Bridge View, both of Ill., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Dec. 12, 1974, Ser. No. 532,022

Int. Cl.[2] F16D *7/00*

U.S. Cl. 64—29 **8 Claims**

1. In an overload clutch in which a driven member is releasably connected to a driving member by means of a spring loaded follower, mounted on one of said members, normally engaged in a seat in a cam plate mounted on the other of said members, the improvement comprising a generally circular cam plate, narrow in its axial dimension relative to its radial dimension, fixedly mounted to a hub, said cam plate having in its periphery said seat; a housing rotatably mounted on said hub, said housing completely enclosing said cam plate, said housing having within it a lever cavity, spaced, aligned journal wells opening through side walls defining said lever cavity on opposite sides of said cam plate, and a spring well opening into said lever cavity at a point axially displaced from said cam plate; anti-friction bearings between said housing and said hub and providing bearing surfaces for relative rotation between said housing and said hub; annular seal means between said housing and said hub outboard of said anti-friction bearings in



both axial directions, a dog-leg lever mounted in said lever cavity on a shaft journaled in anti-friction bearings mounted in said journal wells, said lever having a yoke at one end with arms positioned at either side of the axial extent of said cam plate and a pin extending between said arms, and a leg on the other side of said shaft from said yoke extending, at an angle, to a position axially clear of the cam plate at the end of said leg opposite said yoke; a roller-follower rotatably mounted, on anti-friction bearings, on said lever yoke pin, said roller-follower seating in said cam plate seat; and a compression spring seated at one end in said housing spring well and bearing at its other end upon said lever leg at the end of said lever leg axially clear of said cam plate.

3,924,422

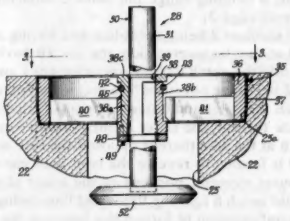
MOLD STOPPER

Louis Sandor, Hammond, Ind.; Andrew Gerald Germain, Itasca, Ill.; Donald Ray Wiles, Kansas City, Kans., and Ronald A. Filippini, Chicago, Ill., assignors to Amsted Industries Incorporated, Chicago, Ill.

Filed Nov. 1, 1974, Ser. No. 519,928

Int. Cl.[2] B22D *17/30*

U.S. Cl. 164—304 **5 Claims**



1. A mold structure comprising, in combination,

a mold assembly including

a cope and

a drag

defining therebetween a cavity shaped for forming the desired molded article,

said drag having an ingate in its bottom,

said cope having an opening aligned above said ingate, and a stopper assembly mounted in said cope for stopping the filling of the mold cavity and for preventing reverse flow of metal out of the filled mold cavity, said stopper assembly including

a mounting spider having a mounting ring securely mounted in said opening and a segmented center spool within said ring having an inner bore and defined by a fixed segment fixedly secured relative to said ring and a movable segment radially movable relative to said fixed segment,

biasing means biasing said movable segement radially inwardly, and

a stopper including a stopper plunger having an outer diameter larger than the width of said bore so as to bias said movable segment outwardly against the return bias of said biasing means, and a stopper washer carried at the lower end of said stopper plunger within said cavity adapted to seat against said ingate.

3,924,423

METHOD AND MACHINE FOR MANUFACTURING STOCKINGS

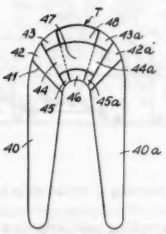
Francesco Lonati, Via Valsorda 28, Brescia, Italy (25100)

Filed Nov. 10, 1972, Ser. No. 305,632

Claims priority, application Italy, Nov. 13, 1971, 31070/71

Int. Cl.[2] D04B 9/42

U.S. Cl. 66—43 **14 Claims**



1. A method for manufacturing seamless panty hose and the like having a tubular panty portion with a waist opening and two legs integral with said panty portion on a circular hosiery knitting machine having a needle cylinder, the method including the steps of knitting a first of said legs by continuously rotating said needle cylinder and forming complete courses, knitting a panty portion adjacent said waist opening by reciprocating said needle cylinder and knitting said tubular panty portion with substantially all the needles of said needle cylinder during each of at least a number of strokes of reciprocation and controlling the needles to form a knit selvage edge at the end of each of said at least a number of strokes of reciprocation to define said waist opening, and knitting a second of said legs by continuously rotating said needle cylinder and forming complete courses.

3,924,424

APPARATUS FOR TREATING CLOTH WITH LIQUID

Mikio Watanabe, 6-23-1, Muika, Kanazu-cho, Saki-gun, Fukui, and Keizo Ohtori, Dai 8-9-15, Takayanagi-cho, Fukui, Fukui, both of Japan

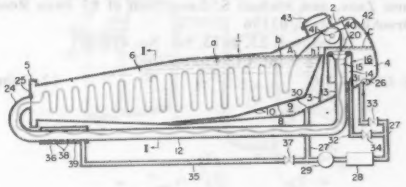
Filed Sept. 7, 1973, Ser. No. 395,133

Claims priority, application Japan, Sept. 8, 1972, 47-90077

Int. Cl.[2] D06B 3/28

U.S. Cl. 68—177 **3 Claims**

1. Apparatus for treating cloth with a liquid comprising an inclined elongated vessel having a first end and a second end, said first end being disposed at an elevation higher than said second end, a partition wall located proximate said first end dividing said vessel into a tank section and a reservoir section, means defining an auxiliary liquid stream chamber within said reservoir section, a guide tube extending externally along said vessel from said first end into flow communication with said second end, said guide tube extending at said first end upwardly through said auxiliary liquid stream chamber, said guide tube and said auxiliary liquid stream chamber each including overlapping terminal wall portions defining therebetween an annular passage enabling a first liquid flow therethrough from the interior of said auxiliary liquid stream chamber into said guide tube, with said terminal wall portion of said auxiliary liquid stream chamber extending over the terminal



wall portion of said guide tube to define an upwardly directed flow opening through which a second liquid flow from said reservoir section may overflow into said guide tube, said annular passage being configured to introduce into said guide tube said first liquid flow in a downwardly directed direction at a point below the level at which said second liquid flow overflows into said guide tube, a driving reel provided above said liquid reservoir for introducing and circulating through said apparatus cloth to be treated therein, said reel being arranged to cause said cloth to pass downwardly into said guide tube through said upwardly directed flow opening past said annular passage, and means for circulating through said apparatus treatment liquid for treating said cloth.

3,924,425

PRESSES FOR WASHING

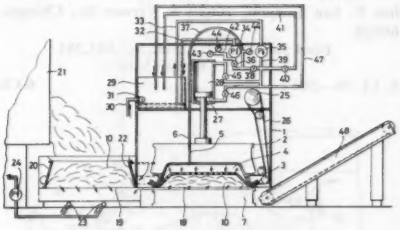
Hans F. Arendt, Bleichinsel, 712 Bietigheim, Germany

Filed Feb. 25, 1974, Ser. No. 445,580

Claims priority, application Germany, Mar. 6, 1976, 2311013

Int. Cl.[2] D06F 47/00

U.S. Cl. 68—242 **7 Claims**



1. A press for removing water from wet washing comprising:

A. A perforated plate for receiving the wet washing,

B. A fluid actuated ram reciprocal with respect to the perforated plate, the ram having a bell-shaped bellows support attached thereto on the end adjacent to the perforated plate, and a diaphragm forming a bellows and sealing the bell-shaped bellows support said bellows diaphragm and said bell-shaped bellows support being separated by a cavity for receiving a pressure medium, and

C. A conveyor frame for receiving said wet washing and being, reciprocally moveable at right angles with respect to the ram for introducing and discharging said washing

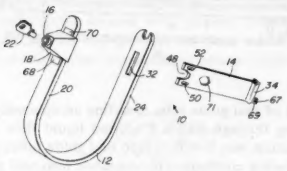
from said plate, said conveyor frame being substantially shaped to correspond to the shape of said diaphragm of said bellows, for pre-shaping the wet washing into a batch and conveying the batch of wet washing between the perforated plate and the bellows diaphgram such that upon inflation of said bellows by said pressure medium water is forced from said washing through said perforated plate.

3,924,426

LOCK FOR BICYCLES AND THE LIKE

Ernest Zane, and Michael S. Zane, both of 85 Dean Road, Brookline, Mass. 02146

Filed Nov. 23, 1973, Ser. No. 418,427
Int. Cl.[2] E05B *73/00*
U.S. Cl. 70—18 **12 Claims**



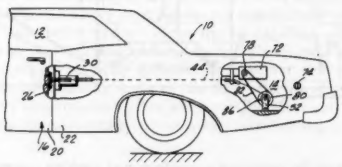
1. A locking mechanism, comprising
a. first and second members relatively movable to one another and adapted for locking and unlocking engagement,
b. said first member including a bolt formed with a pair of openings near one end thereof,
c. said second member including a hollow bonnet formed with an opening therein and a rotatable lock mounted in said bonnet at said opening,
d. said lock including a pair of L-shaped cams offset from the axis of rotation of said lock and extending in spaced parallel relation on opposite sides of said lock whereby the ends of said cams will engage said bolt holes when said lock is turned to a locked position.

3,924,427

ANTI-THEFT AUTOMOBILE DOOR LOCK

Jaime E. San Juaquin, 10629 S. Vernon St., Chicago, Ill. 60628

Filed July 27, 1973, Ser. No. 383,391
Int. Cl.[2] E05B *65/30*
U.S. Cl. 70—264 **6 Claims**



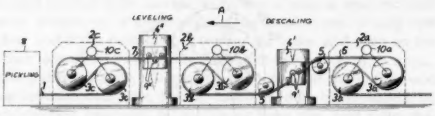
1. An anti-theft lock installed in a vehicle, comprising:
a passenger compartment including a door frame and a hinged door closing said frame;
a lockable trunk compartment;
means defining a hole in an unhinged edge of said door, said means including a plate fixed to said door and having the hole therein;
pin means mounted in said door frame opposite the hole including a movable lock pin for entry into and withdrawal from the hole; and
pin operating means including motor means mounted and concealed in said trunk compartment and connecting means connecting said motor means to said lock pin;
said connecting means including
a shaft mounted in said trunk compartment and rotatable in both directions, said shaft connected to said motor means,
a pulley mounted on said shaft for rotation therewith, and a cable having one end connected to said lock pin and the other end connected to said pulley, and
said pin means further including
a frame connected to said door frame,
at least one second pin extending from said frame,
at least one third pin extending from said lock pin, and
biasing means for biasing said lock pin toward the hole in said plate, said biasing means including a spring connecting said second and third pins.

3,924,428

METHOD OF AND APPARATUS FOR DESCALING AND LEVELING A METAL STRIP

Oskar Noe, Mulheim (Ruhr), Germany, assignor to Firma BWG Bergwerk- und Walzwerk-Maschinenbau GmbH, Duisburg, Germany

Filed Oct. 7, 1974, Ser. No. 512,604
Claims priority, application Germany, Oct. 8, 1973, 2350503
Int. Cl.[2] B21B *45/06;* **B21D** *1/04*
U.S. Cl. 72—40 **4 Claims**



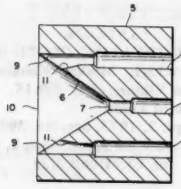
1. A method of treating a metal strip comprising the steps of:
longitudinally stretching said strip to a relatively small extent between 0.5 and 1.3 percent corresponding to maximum-descaling stretch while reverse bending the strip to remove scale from the strip;
thereafter longitudinally stretching said strip to a relatively large extent sufficient to level said strip; and
pickling said strip after leveling same.

3,924,429

METHOD AND APPARATUS FOR REDUCING EXTRUSION START-UP PRESSURE

Francis Joseph Fuchs, Jr., Princeton Junction, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Nov. 13, 1974, Ser. No. 523,403
Int. Cl.[2] B21D *22/10*
U.S. Cl. 72—60 **12 Claims**



1. Method of producing wire from a billet, said method comprising:

a. applying force to the billet to commence extrusion of the billet simultaneously through first die aperture means and second die aperture means;

b. after extrusion of the billet simultaneously through the first die aperture means and the second die aperture means has commenced, and while maintaining force on said billet, gradually closing the second die aperture means;

c. continuing the application of force to said billet to continue the extrusion of said billet through said first die aperture means to produce wire.

3,924,430

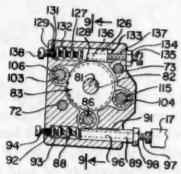
SWING ROLL TOOL ASSEMBLY

Joseph B. Plevyak, 19 Jefferson St., Newton, N.J. 07860

Filed Oct. 21, 1974, Ser. No. 516,268

Int. Cl.[2] B23P 9/02; B21H 7/14

U.S. Cl. 72—85 4 Claims



1. A roll tool assembly adapted for use with a lathe turret having a radially extending mounting opening, comprising a main body portion and a mounting stud radiating from one side of the main body and adapted to be extended into the mounting opening in the lathe turret, said main body having diagonally opposed holes on its front face, swing arms respectively carrying tooling rolls, said swing arms having inwardly extending projections respectively pivotally mounted in the respective diagonally opposed holes, an idler gear mounted upon the main body and said pivot projections respectively having pinion gears meshing with the idler gear, and gear means carried upon the main body and operable upon the idler gear to rotate said idler and pinion gears for swinging the arms and the tool rolls simultaneously into engagement with the opposite sides of a workpiece, said tool rolls coming into engagement with the surfaces of the workpiece on dead center diameter so that equal and opposing pressure will be effected between the tool rolls, a rack gear means for rotating said pinion gears and swinging said tool arms, said rack gear means being spring pressed and slidably carried on said main body, said gear means journaled upon said body and meshable with the idler gear and with the rack gear means, said rack gear means being adapted to be actuated by engagement with a movable part of the lathe; a second rack gear means slidably carried by the main body and having rack teeth meshing with the idler gear, a compression spring urging the second rack gear means in a direction to an outermost position toward the movable lathe part, said spring being further compressed upon the first rack gear means being operated by said movable lathe part and an adjusting screw means threaded into one end of the second rack bar and engageable with the main body to limit the movement of the first rack bar and the inward swinging of the roll swing arms.

3,924,431

MACHINE FOR STRAIGHTENING ELONGATED OBJECTS

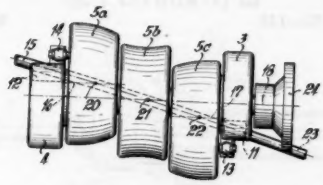
Heinz Hartkopf, Solingen, Germany, assignor to Th. Kieserling & Albrecht, Solingen, Germany

Filed Aug. 28, 1974, Ser. No. 501,149

Claims priority, application Germany, Sept. 5, 1973, 2344613

Int. Cl.[2] B21D 3/04

U.S. Cl. 72—98 8 Claims



1. A straightening machine for elongated workpieces comprising: opposed straightening rolls having axes positioned at an angle to the longitudinal axis of the workpiece, one of said straightening rolls including three rollers mounted on parallel axes, the two outer rollers being mounted eccentrically in relation to the center roller and being adjustable in relation thereto along an arc, the points of contact between said rollers and said workpiece being in a plane with the longitudinal axis of the workpiece.

3,924,432

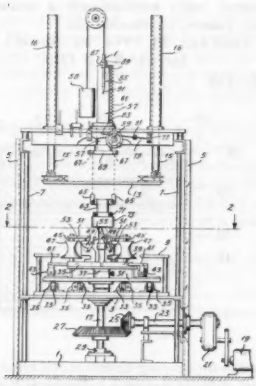
APPARATUS FOR FLARING EDGES OF CIRCULAR OPENINGS

Daniel J. Yarnold, Memphis, Tenn., assignor to Memphis Metal Manufacturing Company, Inc., Memphis, Tenn.

Filed Feb. 25, 1975, Ser. No. 552,988

Int. Cl.[2] B21D 19/04

U.S. Cl. 72—123 14 Claims



1. Apparatus for flaring the part of a sheet of metal surrounding a circular opening therein including a drive shaft coaxial with the opening, a flaring roll engageable with the edge of the metal defining the opening, means supporting said flaring roll for revolution by said shaft, a table rotatable by said shaft and flaring roll mounting means carried by said supporting means and by said rotatable table and movable radially thereof, said flaring roll support means having anti-friction elements supporting the same on said table, and mechanism actuated by said shaft for applying force to said flaring

roll and move it radially of said table on said antifriction means.

3,924,433

STOP COLLAR FOR TUBE EXPANDER

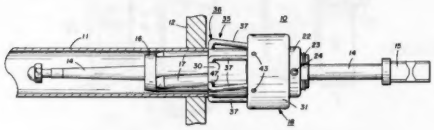
Paul Warren Martin, Springfield, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed July 9, 1973, Ser. No. 377,683

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] B21D *3/04, 41/02*

U.S. Cl. 72—122 8 Claims



1. In a tube expander including a rotatable tubular cage about which to receive a tube end to be expanded, forming rollers contained in the outer periphery of said cage and a rotatable tapered mandrel within said cage for driving said cage and rollers in an expanding relation to a tube and received thereon, a substantially non-rotatable stop collar adapted for limiting axial advance of a received tube end onto said cage, said stop collar comprising a plurality of individual means disposed circumferentially about said cage operably independent of each other, said individual means each extending into engagement with the periphery of said cage at a predetermined location in the path of tube advance, and being operably adapted to follow the rotating periphery of said cage and rollers in a surface tracking relation therewith.

3,924,434

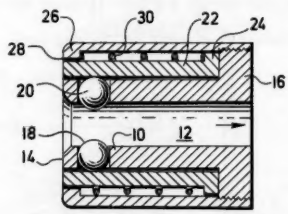
APPARATUS FOR SHAPING HOLLOW METAL BODIES

Josef Fulier, Nove Mesto nad Vahom, Czechoslovakia, assignor to Vyskumny ustav mechanizacie a automatizacie, Nove Mesto nad Vahom, Czechoslovakia

Filed Apr. 25, 1974, Ser. No. 463,915

Int. Cl.[2] B21D *15/02*

U.S. Cl. 72—208 10 Claims



1. Apparatus for shaping hollow metal blind rivets comprising a hollow support having a cylindrical bore, at least one radial opening formed in said support, forming elements rotatably arranged in said radial openings and extending into said bore, an elongated mandrel for receiving and axially inserting said rivets within said bore, said mandrel having an outer contour conforming to the desired shape of said rivet, a movable pressure element at least partially surrounding said support and engaging the external surfaces of the forming element to conjointly roll therewith and to exert a radially inward force on each movement of said mandrel and rivet through said bore, to cause said forming elements to shape said rivet.

3,924,435

DEVICE FOR INSERTING PLUGS IN A PLUG MILL

Louis E. Franceschina; Fred Haromy, both of Sault Ste. Marie, and Frederick W. Kruppert, Goulais River, Ontario, all of Canada, assignors to The Algoma Steel Corporation, Limited, Sault Ste. Marie, Canada

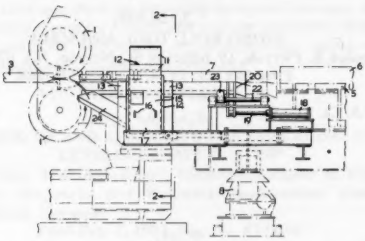
Filed July 26, 1973, Ser. No. 382,798

Claims priority, application Canada, Aug. 2, 1972, 148540

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] B21B *17/10*

U.S. Cl. 72—209 11 Claims



1. In a plug mill for use in reducing the wall thickness of a heated seamless tube to the desired gauge, said plug mill comprising guide means for guiding said heated seamless tube along a defined path in said mill, a pair of rotatable grooved rolling rolls disposed transversely of said path, said rolls in their rolling position providing a first gap therebetween forming a part of said defined path, said first gap being dimensioned such that said rollers grip said tube in said grooves whereby on rotation thereof said tube in said first gap is pulled therethrough, means for rotation of said rolling rolls in said rolling position, retractable means for moving said tube along said defined path into said first gap, a pair of stripper rolls disposed transversely of said path and downstream of said rolling rolls having a second gap therebetween forming part of said defined path adapted in their stripping position to return the seamless tube along said path after rolling thereof by said rolling rolls, a mandrel extending longitudinally of said path securely mounted at one end thereof and having the free end thereof adapted to releasably accommodate a plug member, said mandrel extending through the second gap between the stripper rolls with a plug member, in use, disposed in the first gap between the rolling rolls, the improvement comprising means for removably placing a plug in said first gap on said mandrel, said means comprising an inlet guide member disposed in said defined path upstream of and adjacent said first gap in said rolling rolls, a rotary device having a plurality of open pockets spaced around the periphery thereof, said rotary device being offset from said path and adjacent thereto, said rotary device and said inlet guide member being arranged to permit a plug contained in one of said pockets to be discharged into said inlet guide member, which inlet guide member supports the plug as it is moved along said defined path into the first gap between the rolling rolls and into abutment with the free end of said mandrel, said inlet guide member being adapted to provide a closable third gap adjacent said rolling rolls dimensioned to allow a plug to pass therethrough, means operatively associated with said inlet guide member for closing said third gap during the presence of the plug in said inlet guide member to provide said support of the plug as it is moved into said first gap and for opening said third gap to allow a plug falling from said first gap under gravity subsequent to operation of the rolling rolls to pass through said third gap, and means for guiding the plug passing through said third gap to an unoccupied pocket in said rotary device.

3,924,436

METHOD AND APPARATUS FOR FORMING CUP-SHAPED METAL ARTICLES

Kazunaga Misonoo, Kudamatsu, Japan, assignor to Kozo Yoshizaki, Tokyo, Japan

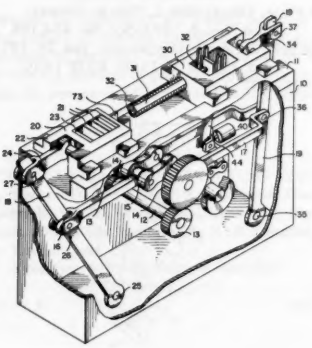
Filed June 25, 1973, Ser. No. 373,297

Claims priority, application Japan, June 23, 1972, 47-62318; Apr. 24, 1973, 48-45767

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² B21D *45/00*

U.S. Cl. 72—345 **5 Claims**



1. A method of forming cup-shaped metal articles by means of at least one die and a punch, said method comprising:

positioning a metal blank adjacent said at least one die;

simultaneously moving said punch and said at least one die from spaced apart withdrawn positions thereof toward each other to adjacent forming positions thereof, thereby causing said punch to force said blank through said at least one die and forming said metal article;

simultaneously moving said punch and said at least one die away from each other; and

removing said thus formed metal article from said punch, said step of removing said formed metal article from said punch comprising moving a knockout punch which is coaxially positioned within said punch longitudinally outwardly of said punch toward said at least one die to a position beyond said forming position of said punch.

4. An apparatus for forming cup-shaped metal articles from a metal blank, said apparatus comprising:

a frame having a slideway surface thereon;

a punch and at least one die mounted to move toward and away from each other on said slideway surface;

means for selectively positioning a metal blank adjacent said at least one die;

means for simultaneously moving said punch and said at least one die from spaced apart withdrawn positions thereof toward each other to adjacent forming positions thereof and for causing said punch to force said metal blank through said at least one die, thereby forming said cup-shaped metal article; and

means for removing the thus formed cup-shaped metal article from said punch, said means for removing comprising a knockout punch coaxially and longitudinally movably positioned within said punch, and means for moving said knockout punch longitudinally outwardly of said punch toward said at least one die to a position beyond said forming position of said punch.

3,924,437

PROCESS FOR THE NON-CUTTING PRODUCTION OF SHEET STEEL CONTAINERS

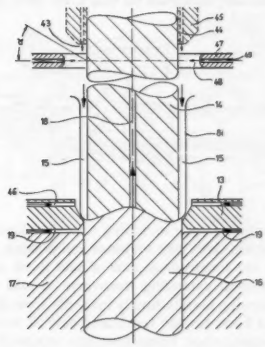
Wilhelm Hörtig, Auerbach, Germany, assignor to K.M. Engineering Aktiengesellschaft at Herrengrabenweg, Basel, Switzerland

Filed Feb. 9, 1973, Ser. No. 330,921

Claims priority, application Switzerland, Feb. 11, 1972, 1967/72

Int. Cl.² B21D *22/28*

U.S. Cl. 72—349 **24 Claims**



1. Process for the production of metal containers, comprising the steps of:

a. deep drawing a sheet metal blank into a cup-shaped blank with a cylindrical portion having a wall thickness substantially the same as said sheet metal blank,

b. providing a plurality of individual forming stages each of which includes a die and corresponding punch member for decreasing the inside diameter of the cup-shaped blank and decreasing the wall thickness of the cup-shaped blank,

c. subjecting said cup-shaped blank only to a separate succession of die and punch members to perform said individual forming stages one at a time to effect a decrease in the inside diameter and wall thickness of the cup-shaped blank at a working zone around the periphery of the blank,

d. said working zone being moved along the length of the blank as said blank moves through said die,

e. providing the punch member at each forming stage with an outside diameter that is smaller than the inside diameter of the cup-shaped blank being formed so that an annular gap is disposed therebetween to a point contiguous to said working zone,

f. introducing a fluid medium into said annular gap to effect cooling of the metal directly at the working zone, and

g. effecting the same frequency of working stroke for all of the punch members operating each of the forming stages.

3,924,438

HYDRAULIC CABLE BENDER

Wayne Linquist; Vernon W. Pearson; Kenneth Hagemeyer, and William E. Smeltzer, all of Rockford, Ill., assignors to Greenlee Brothers and Co., Rockford, Ill.

Filed Sept. 23, 1974, Ser. No. 508,496

Int. Cl.² B21D *7/04*

U.S. Cl. 72—388 **3 Claims**

1. In a bending apparatus for bending an elongated member as a cable or the like, the combination comprising:

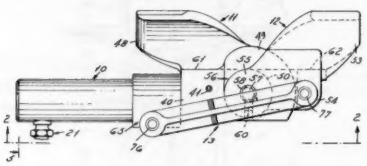
a. an actuating means having an extendable and retractable ram;

b. a drive shoe body fixedly mounted on said ram for engaging an elongated member, said drive shoe body including:

1. a drive shoe, said drive shoe including a first hook with open and closed sides with an outer end portion perpendicular to the longitudinal axis of said hook and an inner end portion extending transverse to said longitudinal axis slanting longitudinally inwardly from the open side of said hook toward the closed side of said hook;

2. a cable bending guide means on the opposite end of said drive shoe body adapted to provide an arcuate seat for said elongated member;

c. a rotating shoe for engaging an elongated member and being pivotally mounted on said drive shoe body;



1. said rotating shoe including a second hook with open and closed sides with an outer end portion perpendicular to the longitudinal axis of said hook and an inner end portion extending transverse to said longitudinal axis slanting longitudinally inwardly from the open side of said hook toward the closed side of said hook;

d. said rotating shoe being pivotally mounted on a pivot means on said drive shoe with the inner end portion on each of said hooks in opposed relationship to each other;

e. linkage means connecting said rotating shoe to said actuating means;

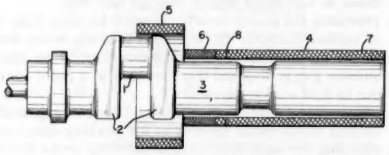
whereby an elongated member adapted to be mounted within each of said hooks is adapted to be bent around said arcuate bending guide when said actuating means in energized to extend said ram.

3,924,439

PROCESS FOR THE MANUFACTURE OF CRANK-SHAFTS

Roger Poncin, Liege, Belgium, assignor to Elphiac S.A., Brussels, Belgium

Filed May 16, 1974, Ser. No. 470,461
Claims priority, application Belgium, May 16, 1973, 799572
Int. Cl.² B21K *1/08*
U.S. Cl. 72—342 **3 Claims**



1. A process for the stepwise forging of discrete sections of a crankshaft comprising the steps of:

a. relatively positioning a section of a cylindrical blank and a main induction heating coil by:

1. closely surrounding a portion of said section contiguous to a previously forged web of the crankshaft by a first part of said main induction heating coil having closely wound turns;

2. closely surrounding another portion of said section, spaced from said previously forged web by a second part of said main induction heating coil having less closely wound turns than said first part;

b. separately surrounding said previously forged web by an auxiliary induction heating coil, which is discrete from said main induction heating coil, which is of substantially larger diameter than said main induction heating coil, and which is disposed coaxially with respect thereto;

c. energizing said main induction heating coil;

d. energizing said auxiliary induction heating coil in phase;

e. forging a new crankpin and pair of associated webs from said section;

f. cooling the newly forged section;

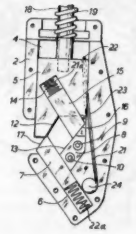
g. repeating said positioning, surrounding, energizing, forging and cooling steps.

3,924,440

CLAMPING TOOL

Gunnar Vinje, Vilbergveien 2, Oslo 6, Norway

Filed Nov. 9, 1973, Ser. No. 414,198
Claims priority, application Norway, Jan. 25, 1973, 308/73
Int. Cl.² B21K *25/00;* **B23P** *19/02*
U.S. Cl. 72—397 **4 Claims**



1. In a clamping tool having a housing, the tool further comprising:

at least a first jaw member stationarily connected to the housing;

at least a second jaw member slideably mounted in the housing for displacement relative to the first jaw member; actuator means connected to the second jaw member for displacing it;

a plurality of resiliently biased third jaw members slideably mounted within the housing, each third jaw member disposed in coacting relationship with all other jaw members so that all the jaw members constitute work-engaging surfaces therebetween; and

a drive member contained in the housing for driving at least one of the third jaw members to an open position, the drive member having a first end for movably abutting the second jaw member, and a second end of the drive member fastened to at least one of the third jaw members for moving this member to an open position permitting entry of a work piece into the tool.

3,924,441

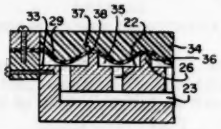
PRIMARY SURFACE HEAT EXCHANGER AND MANUFACTURE THEREOF

Leslie C. Kun, Williamsville, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 189,659, Oct. 15, 1971, Pat. No. 3,757,856. This application June 21, 1973, Ser. No. 372,339
Int. Cl.² B21D *22/04*
U.S. Cl. 72—475 **2 Claims**

1. A die for use in the fabrication of isostress contoured sheets wherein said die has on at least a portion of its surface isostress contours with substantially uniformly disposed unidirectional projections having a dimensional size and a directional relationship therebetween defined by a $^{H}/_{D}$ ratio of between about 0.05 and about 0.2; a $^{D}/_{d}$ ratio of between about 3 and about 10; and a D dimension of between about

0.2 and 2.5 inches; wherein H equals the maximum height measured perpendicularly from a surface which contains the extremeties of the projections enclosing an isostress contour to the innermost crest of the isostress contour; D equals the



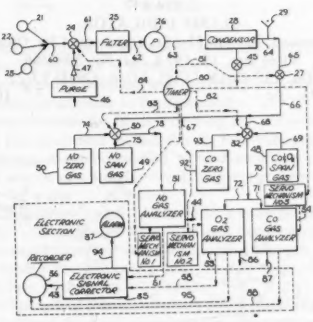
spacing between the centers of the closest adjacent projections on the surface of the die; and *d* equals the equivalent diameter defined by the ratio $^{4a}/_{p}$ whereby *a* equals the area of the load-bearing segment of the wall-supporting projection and *p* equals the perimeter of said load-bearing segment.

3,924,442

POLLUTANT VARIATION CORRECTING SYSTEM

Stephen E. Kerho, Tustin; Claude S. Lindquist, Huntington Beach; John R. White, Tustin, and Bernard P. Breen, Laguna Beach, all of Calif., assignors to KVB Equipment Corporation, Tustin, Calif.

Filed Oct. 9, 1973, Ser. No. 404,503
Int. Cl.² G01N *31/00*
U.S. Cl. 73—1 R **15 Claims**



1. A system for monitoring effluent gas and for determining the concentration of at least one gas in said effluent gas at predetermined reference conditions comprising:

a. sampling means for sampling said effluent gas and for providing a sample;

b. an analyzing means for analyzing said sample to determine the concentration of at least one gas in said sample, and for generating at least a first electrical signal representative of the concentration of a first gas, said analyzing means being coupled to said sampling means; and,

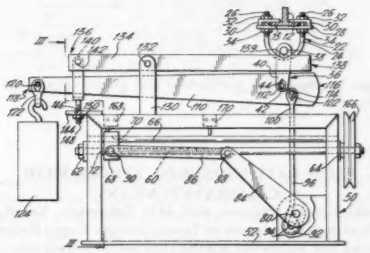
c. correcting means for electrically correcting at least said first electrical signal from said analyzing means to a standard reference gas level, said correcting means being electrically coupled to said analyzing means whereby, said corrected electical signal may be displayed or otherwise monitored, so that the concentration level of at least one gas in said effluent gas may be absolutely determined.

3,924,443

SCALE TESTER

Arthur J. Hebert, 45-45th Ave., Edmundston, New Brunswick, Canada

Filed Sept. 27, 1973, Ser. No. 401,133
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² G01L *25/00*
U.S. Cl. 73—1 B **8 Claims**



1. Apparatus for testing scales of the type which includes a platform and a weight indicating means connected to said platform which is responsive to a weight supported by said platform, said testing apparatus comprising:

a. a first support means having means thereon connecting the same to said platform;

b. a beam supported by said first support means in a testing position;

c. a base;

d. fulcrum means pivotally connecting said beam to said base at a position along the beam to one side of said first support means;

e. a calibrated weight supported by said beam at a position along said beam to the other side of said first support means;

f. a second support means on said base extending at least in part beneath said beam at a position intermediate said first support means and said calibrated weight; and

g. means for selectively moving said fulcrum means upwardly and downwardly with respect to said base and said platform thereby to move said beam between said testing position wherein it is supported by said first support means and said fulcrum means and a non-testing position wherein it is supported by said second support means and said fulcrum means.

3,924,444

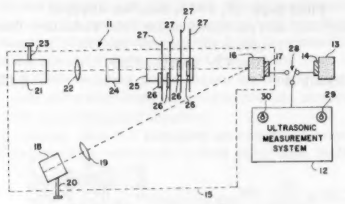
ULTRASONIC CALIBRATION DEVICE

Joseph S. Heyman, Gloucester, Va., and James G. Miller, Clayton, Mo., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed Nov. 11, 1974, Ser. No. 522,556
Int. Cl.² G01M *7/00*
U.S. Cl. 73—1 R **8 Claims**

1. An ultrasonic calibration device for calibrating an ultrasonic instrument that measures the absorption coefficient and phase velocity of a sample under study comprising: a piezoelectric crystal of photoconducting material with transducer means attached to it to form an ultrasonic resonator; bias lamp means for focusing light onto said crystal to simulate the

background absorption coefficient of said sample; and signal lamp means for focusing light onto said crystal to simulate



changes in absorption coefficient and phase velocity of said sample.

3,924,445

FLOW RATE MEASURING SYSTEM WITH CALIBRATION MEANS

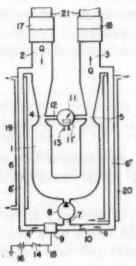
Toshiaki Konomi, Susono, and Akio Takamura, Yokohama, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Kabushiki Kaisha Ono Sokki Seiksakusho, both of, Japan

Filed Sept. 27, 1974, Ser. No. 510,031

Claims priority, application Japan, Sept. 28, 1973, 48-108556; Sept. 29, 1973, 48-108921

Int. Cl.[2] G01F *25/00, 1/36*

U.S. Cl. 73—3 **12 Claims**



1. A fluid flow rate measuring system comprising first passage means defining a flow path through which fluid flow whose rate is to be measured is passed, inlet and outlet means for said first passage means, first and second valve means disposed, respectively, to open and close said inlet and outlet means, a first venturi and a second venturi downstream of said first venturi disposed within said first passage means, bypass passage means defining a flow path extending in parallel to said first passage means connected between said inlet and outlet means, a constant capacity pump connected between said bypass passage means and said first passage means at a point intermediate said first and second venturis, a pressure transducer including calibration means connected between said first and second venturis for producing a reading indicative of the rate of fluid flow through said first passage means, and third valve means operable between an open and a closed position and located within said system to effect, during closure thereof and during closure of said first and second valve means with said constant capacity pump in operation, a reading from said pressure transducer which is equivalent to a predetermined fraction of the flow rate through said constant capacity pump whereby said pressure converter may be calibrated by adjustment of the reading produced thereby to said predetermined fraction.

3,924,446

UNDERWATER CONNECTION APPARATUS

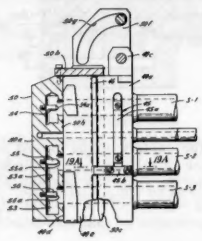
Benton F. Baugh, 9050 Longpoint, Houston, Tex. 77055

Division of Ser. No. 386,431, Aug. 7, 1973, Pat. No. 3,866,677.

This application Nov. 22, 1974, Ser. No. 526,100

Int. Cl.[2] G01M *3/02*

U.S. Cl. 73—37 **8 Claims**



1. Apparatus for testing two or more underwater flowlines, comprising:

first and second flowlines extending from the surface of a body of water and terminating in a flowline flange which receives and supports end portions of said first and second flowlines; and

a testing flange assembly mounted onto said flowline flange and including a passageway therein which is in fluid communication with said supported end portions of said first and second flowlines for providing fluid communication therebetween.

3,924,447

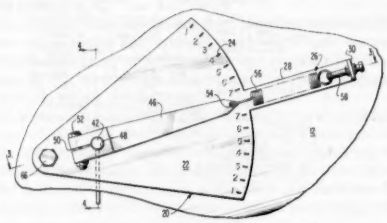
SLUMP INDICATOR

Eldon Garrison, 109 SE. 51st St., Oklahoma City, Okla. 73129

Filed Dec. 19, 1974, Ser. No. 534,306

Int. Cl.[2] G01N *11/00, 33/38;* **G01D** *13/22*

U.S. Cl. 73—54 **10 Claims**



1. A slump indicator for a rotatable drum concrete mixer comprising:

a generally flat base plate adapted for exterior attachment to a side wall of said drum;

shaft means carried by said base plate for rotation about an axis normal to the plane of said base plate along a radius of said drum, said shaft having first and second portions protruding on either side of said plate for disposition interiorly and exteriorly of the drum, respectively;

a paddle attached along an edge to the end of said first portion of said shaft for sweeping an arcuate path about said shaft axis, said paddle being arranged in the path of movement of the concrete mix in said drum to effect rotation of said shaft;

indicator means in the form of a pointer attached to said second portion of said shaft, said pointer cooperating with a graduated scale on said base plate; and

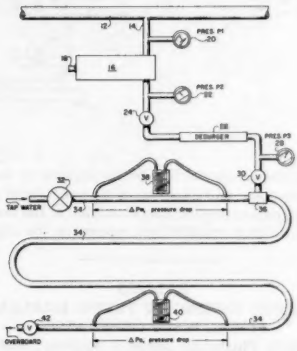
a spring connecting the tip of said pointer to said base plate to bias said pointer to a neutral position and to present a proportionately increasing resistance to rotation of said shaft by said paddle in either direction from said neutral position.

3,924,448

PRESSURE DROP POLYMER CONCENTRATION METER (PCM)

Robert G. Howard, Annapolis, and Edwin L. Zivi, Jr., Severna Park, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 19, 1974, Ser. No. 480,775
Int. Cl.[2] G01N *11/04*
U.S. Cl. 73—55 **5 Claims**



4. Apparatus for determining the dissolved concentration of drag reducing polymer in a medium comprising:

a metering pump sampling and providing a known flow-rate of polymer solution to be measured;

a source of water for further diluting the polymer solution to a concentration measurable by flow-rate effects;

a dispenser-mixer connected to said metering pump and said source of water for combining the polymer solution and the water;

a predetermined length of restrictor tubing connected between said source of water and said disperser-mixer;

a manometer spanning said predetermined length of restrictor tubing for measuring the pressure drop and hence flow-rate of the water therein;

a similar length of restrictor tubing connected to and farther downstream from said predetermined length; and

another manometer spanning said similar length of restrictor tubing, whereby the pressure drop and hence the flow-rate of the drag reducing polymer plus the water may be determined and compared to the flow-rate of the water.

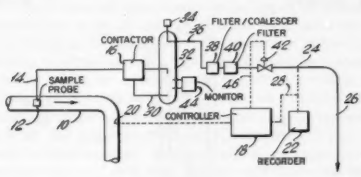
3,924,449

OIL POLLUTION TOTALIZER

James O. Moreau, Morris Plains, and Richard A. Halko, Flanders, both of N.J., assignors to Exxon Research and Engineering Co., Linden, N.J.

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] G01F *1/00*; G01N *1/20*
U.S. Cl. 73—61.1 R **8 Claims**

1. A system for determining the rate and total amount of oil discharged in a flowing discharge stream comprising, means for removing a predetermined sample of said flowing discharge stream; contactor means for intimately mixing said sample with a predetermined volume of solvent; chamber means for receiving and processing the intimately mixed sample and solvent to form a separable first oil-solvent phase and a second phase which is relatively clean; means for recycling the first oil-solvent phase through said contactor means; and outlet means for discharging said relatively clean second phase from said chamber means to an outlet line; flow rate control means operably connected in said outlet line; and



means connected for sensing the relative flow rates of said relatively clean second phase and said flowing discharge stream and controlling said flow rate control means such that the flow rate of said relatively clean second phase is maintained in predetermined direct relation to the flowing discharge stream.

7. The method of claim **6**, including the step of:

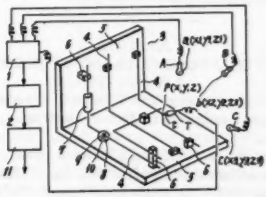
f. filtering the second phase of said mixed stream subsequent to removal of the oil-solvent phase therefrom.

3,924,450

DEVICE FOR MEASURING THREE DIMENSIONAL COORDINATES OF MODELS

Tomoyoshi Uchiyama; Susumu Sekino, and Kenji Tani, all of Osaka, Japan, assignors to Hitachi Shipbuilding and Engineering Co. Ltd., Osaka, Japan

Filed May 10, 1974, Ser. No. 468,867
Claims priority, application Japan, May 10, 1973, 48-52787; May 10, 1973, 48-52788; May 10, 1973, 48-55774; June 12, 1973, 48-70266
Int. Cl.[2] G01S *3/80*
U.S. Cl. 73—67 **8 Claims**



1. A system for measuring the three dimensional coordinates of an object disposed in an area which comprises an oscillating means disposed at or in the vicinity of the object whose dimensional coordinates are to be determined, said oscillating means being adapted to produce supersonic waves, at least three receiving means disposed at at least three positions having known coordinates, means for measuring, electrically, the time required for the supersonic waves to travel from the oscillating means to the receiving means, means for converting the travel time of the supersonic waves to distant measurements and means for producing the three dimensional coordinates of said object from said known coordinate of said three positions and said converted values of distance, said oscillating means comprising a rod provided at one end thereof with a contact point for contacting the object whose coordinates are desired and said rod further containing oscil-

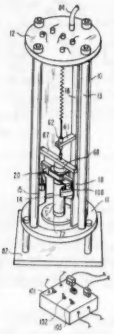
lating elements at the other end thereof, said oscillating elements being unobstructed from the receiving means.

3,924,451

RESONANT COLUMN TESTING APPARATUS

Vincent P. Drnevich, 168 Eastover Drive, Lexington, Ky. 40502

Filed Aug. 21, 1974, Ser. No. 499,317
Int. Cl.[2] G01M 7/00
U.S. Cl. 73—67.2 **9 Claims**



1. Resonant column testing apparatus comprising, a first platen for supporting one end of a column of material to be tested, a second platen resting in contact with the other end of said column, a movable magnet plate attached to said second platen and carrying first magnets, stationary first coils cooperating with said first magnets, a second coil disposed centrally of said plate and attached thereto, a second stationary magnet supported for coaction with said second coil, an electrical circuit including means to energize said coils with a sinusoidally variable and controlled voltage whereby said column may optionally be subjected to resonant torsional vibration by the interaction of said first coils and first magnets and to resonant longitudinal vibration by the interaction of said second coil and said second magnet, and means in said circuit for measuring the behavior of said column during application of either of said vibrations.

3,924,452

SECTOR SCANNING ULTRASONIC INSPECTION APPARATUS

Edward P. Meyer, Boulder, and William L. Wright, Longmont, both of Colo., assignors to Picker Electronics, Inc., Longmont, Colo.

Continuation of Ser. No. 801,882, Oct. 1, 1969, abandoned, which is a continuation-in-part of Ser. No. 373,312, June 8, 1964, abandoned. This application Aug. 7, 1970, Ser. No. 62,143
Int. Cl.[2] G01N 29/04
U.S. Cl. 73—67.8 S **15 Claims**

9. A method of ultrasonically examining the internal structure of an object to provide improved resolution with an electroacoustic transducer mounted on the end of a series of pivotally interconnected arms comprising the steps of:

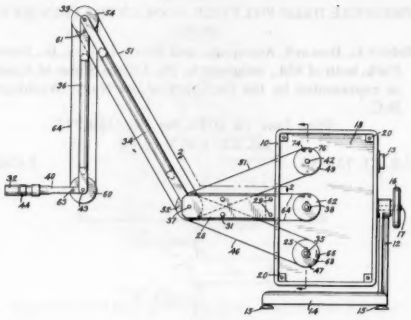
a. positioning said transducer against said object to be investigated;

b. moving said arms within a single plane while pivoting the said transducer in a rocking movement in said single plane substantially about a single point on the surface of said object in the area thereof to be investigated;

c. transmitting ultrasonic signals from the said transducer into said object and receiving by means of said transducer ultrasonic signals reflected by internal structure of said object;

d. developing electrical signals representative of the positioning of said arms and said transducer; and,

e. producing a visual representation of the ultrasonic reflections and controlling the origin and direction of the visual



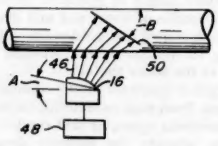
representation productior. to correspond to location of the transducer and direction of transmission of the ultrasonic signals to provide a reproduction of the investigated object which is oriented with respect to the object.

3,924,453

ULTRASONIC TESTING OF TUBING EMPLOYING A SPIRAL WAVE GENERATOR

John O. Clark, Pittsburgh; James B. Rafferty, Shaler Twsp., Allegheny County, and Donald G. Schindler, Whitehall Borough, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed May 4, 1973, Ser. No. 357,131
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] G01N 29/04
U.S. Cl. 73—67.8 S **5 Claims**



1. Apparatus for detecting spirally oriented defects in the wall of a tube included an angular range from the longitudinal axis of the tube comprising

a transducer for providing a beam of ultrasonic energy,

a lens coupled to the transducer with a generally convex radiating surface for shaping the beam of ultrasonic energy in a divergent pattern,

means for coupling the divergent ultrasonic beam to the wall of the tube,

said transducer, lens and means for coupling being aligned to generate spirally oriented shear waves in the tube wall when the beam is directed into the tube wall and

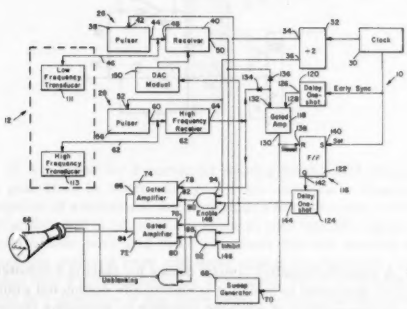
means connected to said transducer for detecting reflections of ultrasonic energy back from a defect in the tube wall.

3,924,454

MULTI-FREQUENCY ULTRASONIC TESTING SYSTEM

Jerry T. McElroy, Danbury, and Sidney Soloway, Wilton, both of Conn., assignors to Automation Industries, Inc., Los Angeles, Calif.

Filed Oct. 24, 1973, Ser. No. 409,078
Int. Cl.[2] G01N 29/04
U.S. Cl. 73—67.8 R 7 Claims



1. A nondestructive testing system for inspecting a workpiece, said system including the combination of

a search unit for being acoustically coupled to said workpiece and for scanning said workpiece,

a clock for generating a series of clock pulses,

a divider coupled to said clock for dividing said series of clock pulses into a first series of synchronizing pulses and a second series of synchronizing pulses, the pulses in said first and second series alternating with each other,

a first pulser coupled to said divider and responsive to the synchronizing pulses in said first series, said pulser being coupled to said search unit and effective to cause said search unit to transmit ultrasonic energy of a first frequency into said workpiece in response to the synchronizing pulses in said first series,

a second pulser coupled to said divider and responsive to the synchronizing pulses in said second series, said pulser being coupled to said search unit and effective to cause said search unit to transmit ultrasonic energy of a second frequency into said workpiece in response to the synchronizing pulses in said second series,

said search unit being effective to receive echoes of said ultrasonic energy and produce a first series of signals of said first frequency and a second series of signals of said second frequency,

a first receiver coupled to said search unit and responsive to said signal of said first frequency,

a second receiver coupled to said search unit and responsive to said signal of said second frequency,

a cathode ray oscilloscope for producing a visual display of signals coupled thereto, and

means for coupling said cathode ray oscilloscope to said first receiver in response to the synchronizing pulses in said first series and for coupling said cathode ray oscilloscope to said second receiver in response to the synchronizing pulses in said second series whereby said oscilloscope produces a combined display of said signals.

3,924,455

METHOD OF REMOVING BRITTLE LACQUER STRESS COATINGS AND STRIPPING COMPOSITIONS THEREFOR

Finn Bergishagen, Union Lake, and James J. Schmidt, Livonia, both of Mich., assignors to Dana Corporation, Toledo, Ohio and Product-Sol, Inc., Birmingham, Mich.

Filed Nov. 20, 1974, Ser. No. 525,379
Int. Cl.[2] G01B 5/30, 7/16
U.S. Cl. 73—88 6 Claims

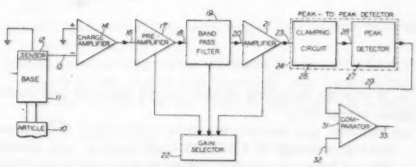
1. The method of nondestructive testing of structures which comprise the steps of fabricating a model to accurate fullsize or fractional scale employing a rigid polyvinyl chloride plastic, applying a brittle lacquer coating to those surface areas of the model at which an evaluation of the stress gradient is to be investigated, loading the model to achieve a desired strain and a cracking of the said brittle lacquer coating in response to the strain of the underlying structural substrate, observing the brittle lacquer coating crack pattern as an indication of the concentration and direction of strain and thereafter removing all or selected portions of said brittle lacquer coating to render the model reuseable for future testing by applying a liquid stripping solution to the surface of said brittle lacquer coating to effect a solubilization and stripping thereof without injury and modification of the mechanical properties and dimensions of the underlying polyvinyl chloride substrate, said stripping solution comprising a mixture containing about 5% to about 30% of a halogenated solvent, about 20% to about 40% of a glycol ether, about 20% to about 60% mineral spirits, up to 10% of a lower alcohol and up to 10% of a surfactant.

3,924,456

METHODS AND APPARATUS FOR DETECTING THE PRESENCE OF CRACKS IN A WORKPIECE BY THE USE OF STRESS WAVES EMITTED THEREFROM

Sotirios John Vahaviolos, Cranbury, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Aug. 17, 1973, Ser. No. 389,414
Int. Cl. G01n 3/100, 29/100
U.S. Cl. 73—88 R 15 Claims



2. Apparatus for detecting and measuring stress waves propagating in the material of a workpiece while said material is being subjected to a load for detecting the presence of a defect such as a crack in said material, the apparatus comprising, in combination:

a. a sensor for detecting stress waves propagating in the material of said workpiece to produce an electrical output representative of the detected waves;

b. first signal processing means comprising:

i. an amplifier for amplifying the electrical output from the sensor, said electrical output comprising waves characterized by both a very short duration and a very fast rise time; and

ii. a band-pass filter connected to the output of said amplifier and having a pass-band which falls outside the range of frequencies normally generated by components in proximity to the apparatus;

c. second signal processing means comprising:

i. referencing means, connected to the output of said first signal processing means, for referencing each first amplitude extremity of the amplified and filtered elec-

trical output from said first signal processing means to a first predetermined d-c voltage; and

ii. a peak detector connected to the output of said referencing menas to provide an output signal indicative of the magnitude of each second amplitude extremity of the referenced amplified and filtered electrical output from said referencing means with respect to said first predetermined d-c voltage; and

d. means connected to the output from said second signal processing means for generating an output signal to indicate the presence of a detected defect when the magnitude of the electrical output signal from said peak detector exceeds a second predetermined value.

3,924,457
MISFIRE DETECTING DEVICE FOR INTERNAL COMBUSTION ENGINE

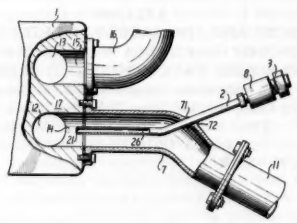
Yujiro Oshima, Ichinomiya; Masao Kataoka, Nagoya; Osamu Tutui, Toyota; Noboru Shibayama, Nagoya; Masayoshi Ohtuka, Nagoya, and Shigehito Ozaki, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan

Filed Mar. 28, 1974, Ser. No. 455,941

Claims priority, application Japan, Mar. 31, 1973, 48-37328

Int. Cl.[2] G01M *15/00*

U.S. Cl. 73—116 **14 Claims**



1. A misfire detecting device for an internal combustion engine, comprising:

an exhaust gas introducing tube comprising tube means having openings at the both ends thereof, one opening thereof being provided at a portion adjacent to an exhaust port in an exhaust passage in order to introduce the exhaust gas from a combustion chamber of the internal combustion engine which is of a piston type and the other opening being provided exterior of the exhaust passage,

a pressure transducer having a pressure sensing part connected to said other opening of said exhaust gas introducing tube; thereby converting a pressure fluctuation of the exhaust gas introduced by said exhaust gas introducing tube to an electrical signal,

a signal processing circuit electrically connected to said pressure transducer for detecting a predetermined signal from said electrical signal of said pressure transducer,

a counter circuit connected to said signal processing circuit for counting the number of times of misfire of the internal combustion engine in a predetermined time period,

whereby the flow fluctuation of the exhaust gas in the exhaust passage is converted to the electrical signal with said pressure transducer for detecting a portion of the pressure fluctuation based on a misfire of the internal combustion engine from said electrical signal, and thereby enabling the misfire of the internal combustion engine to be detected.

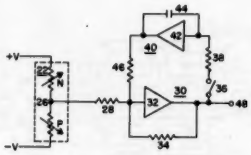
3,924,458
PRESSURE SENSITIVE CONTROL DEVICE

William H. Woodworth, and Robert D. Cunningham, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 1, 1974, Ser. No. 457,159

Int. Cl.[2] G01L *5/22*

U.S. Cl. 73—133 R **1 Claim**



1. A pressure sensitive control device for placing a remotely located apparatus to which it is electrically connected under the positive control of a human operator by providing electrical outputs coupled to said apparatus that are responsive to the hand pressure applied to the device by the human operator, consisting of:

a substantially rigid, hand-holdable member subjected to said pressure applied by the operator;

orthogonally positioned strain gauges mounted on said member for sensing said pressure applied to said member, wherein the electrical conductivity of at least one of said gauges is altered when said pressure is applied;

an individual electrical circuit coupled to each of said gauges for measuring said alteration and automatically compensating for initial conditions;

each gauge having first, second and third external electrical terminals, said first and second terminals connected to equal but opposite voltage sources, and said third terminal disposed electrically between said first and second terminals, and connected to its said circuit;

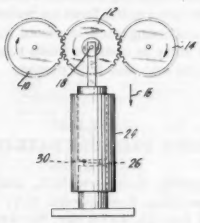
each circuit comprising a first operational amplifier coupled to said third terminal and having a first feedback branch including a resistor coupling the output of said amplifier to its input, and a second feedback branch including a second operational amplifier with capacitive feedback as an integrator and an operator controlled switch for selectively coupling said integrator across said first operational amplifier;

such that said switch is closed coupling said integrator across said first operational amplifier to maintain the output of said device at zero by developing a compensating electrical value in the integrator equal but opposite to the output value of said first amplifier, which integrator value is coupled to the input of said first amplifier to drive the output of said first amplifier to zero; until active operation of the device is initiated by said operator by opening said switch, which opening locks the then value in said integrator to the input of said first amplifier to maintain compensation of the initial conditions causing the output of said first amplifier to be responsive to only said alteration of electrical conductivity of the guage to which the circuit is connected, whereby the output of said device is indicative of only the hand pressure applied to said rigid member by said operator and is precisely indicative thereof for remotely controlling an apparatus with precision.

3,924,459
TORQUE SENSOR WITH MEANS FOR MECHANICAL DAMPING

John W. Ossman, Jr., Clifton, N.J., assignor to Haake, Inc., Saddle Brook, N.J.

Filed Nov. 13, 1974, Ser. No. 523,348
Int. Cl.² G01L 3/02
U.S. Cl. 73—136 R 3 Claims



3. A method for dynamically sensing mechanical torque in a gear train in which said gear train includes: a drive gear capable of a rotational momentum in a first direction; an idler gear disposed in adjacent engagement with said drive gear and intermeshed with said drive gear such that the angular momentum received from said drive gear is mechanically translated into a second direction of rotation which is opposite to said first direction of said drive gear; a driven gear disposed in adjacent engagement with said idler gear and intermeshed with said idler gear such that the angular momentum received from said idler gear is mechanically translated into an angular direction opposite to the direction of rotation of said idler gear, and in which said driven gear is capable of engaging a mechanical load; in which said method comprises the steps of:

a. mechanically coupling a plunger to said idler gear wherein a differential change in angular momentum between said drive gear and said driven gear, said change resulting from a change in torque of the driven gear, will cause a transverse displacement of said idler gear with respect to a line of reference passing through the axes of said drive and driven gears;

b. inserting a replaceable load cell, disposed upon the longitudinal axis of said plunger, said load cell comprising a pressure transducer which will generate an electrical signal having an amplitude which is directly proportional to the pressure applied to said cell; and

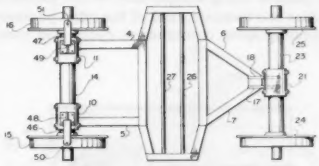
c. interposing a mechanical damper between the bottom of said plunger and said load cell in order to absorb gear and bearing noise which would otherwise impare the quality of the electrical output of said load cell.

3,924,460
MEASURING FRAME FOR A VEHICLE FOR CONTROLLING THE GEOMETRICAL CHARACTERISTICS OF RAILWAY TRACK

M. Johann Lieb, 15, Avenue De La Vallonnette, CH - 1012 Lausanne, Vaud, Switzerland

Filed July 11, 1974, Ser. No. 487,632
Claims priority, application Switzerland, July 16, 1973, 10356/73
Int. Cl. B61k 9/12
U.S. Cl. 73—146 3 Claims

1. A measuring frame, for a control vehicle for the geometrical characteristics of railway tracks, supported on two axles of a bogie of said vehicle and having guidance members for sensors of the rails intended to sense the position of the rails in the plane of the track, characterized in that the frame is of a rigid construction, and is connected at two points on two spaced bearings mounted on a first of the axles between the wheels thereof and on a third bearing mounted on a second of the axles between the two wheels thereof; in that the fixing of the frame to the bearings is not rigid over at least one of the three bearings and permits a clearance of the fixing point of the frame within predetermined limits in a plane parallel to the

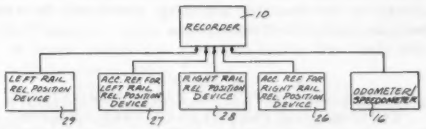


plane of the track in that the fixing of the frame at its third bearing on the second axle comprises a ball and socket joint.

3,924,461
MONITORING SYSTEM FOR DETECTING DEFECTIVE RAILS OR ROAD BEDS

Harris A. Stover, 10306 Mountington Court, Vienna, Va. 22180

Filed Aug. 20, 1974, Ser. No. 499,030
Int. Cl.² B61K 9/00
U.S. Cl. 73—146 10 Claims



1. Apparatus for monitoring and testing rails and road beds comprising:

a vehicle with rail engaging wheels;

an odometer mounted on said vehicle to produce a position reference;

sensing means for sensing the position of the rail as the vehicle passes by;

correlation means receiving the outputs of said odometer and said sensing means to determine the condition of the rail;

wherein said sensing means measures the distance from the vehicle to said rail; and

wherein said sensing means measures the distance from the vehicle to the rail at two locations, one location being near the wheels and one location being remote from the wheels.

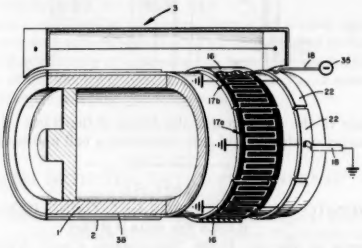
3,924,462
METHOD OF MEASURING THE TONER CONCENTRATION OF A DEVELOPER CIRCULATING IN AN ELECTROPHOTOGRAPHIC REPRODUCTION MACHINE

Hartmut Bock, Fischbach, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Wiesbaden, Germany

Filed Aug. 7, 1972, Ser. No. 278,254
Claims priority, application Germany, Aug. 6, 1971, 2139323
Int. Cl.² G03G 15/08
U.S. Cl. 73—150 R 4 Claims

1. A method of measuring the toner concentration of a developer circulating in an electrophotographic reproduction machine comprising applying different voltages to spaced meshing electrodes on a drum carrying the photoconductor whereby the electrodes are arranged besides the exposure zone of the photoconductor, charging an insulating layer formed on the electrodes simultaneously with the photoconductor, connecting the electrodes just moved into the developing zone by grounding each after the charging step, applying a common electrical potential to the electrodes, a test charge pattern being thereby formed on the insulating layer,

developing the test charge pattern based on a treatment identical to that used for developing the latent charge image, said test charge pattern being independent of the photoconductor's properties and treatment and of the other parameters of the electrophotographic reproduction cycle, and measuring



the darkness of the test charge pattern which is a measure of the toner density by optical reflection carried out by light beams from the same light source, one of the beams being affected by the developed test charge pattern and the other being an unaffected reference beam.

3,924,463

APPARATUS FOR TESTING EARTH FORMATIONS COMPOSED OF PARTICLES OF VARIOUS SIZES

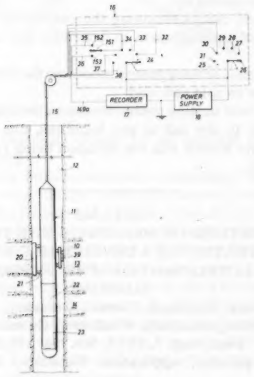
Harold J. Urbanosky, Pearland, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Oct. 18, 1973, Ser. No. 407,736

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] E21B *49/00*

U.S. Cl. 73—155 **29 Claims**



1. Formation-testing apparatus adapted for suspension in a borehole having mudcake lining the walls thereof adjacent to earth formations containing producible connate fluids and comprising:

a body having a fluid passage adapted to receive connate fluids;

fluid-admitting means on said body including a fluid entry adapted to be engaged with a borehole wall for isolating a surface thereof from borehole fluids;

means selectively operable for positioning said fluid-admitting means against a borehole wall to place said fluid entry into communication with earth formations beyond an isolated borehole wall surface; and

selectively-positionable fluid-filtering means cooperatively arranged in fluid communication between said fluid passage and said fluid entry and operatively movable upon engagement of said fluid-admitting means with an isolated borehole wall surface to one filtering position for initially passing mudcake particles displaced from an isolated borehole wall surface on through said filtering means into said fluid passage and operatively movable toward another filtering position whenever loose formation particles are eroded from an isolated borehole wall surface for collecting such loosened formation particles in said fluid entry as connate fluids pass on through said filtering means into said fluid passage.

3,924,464

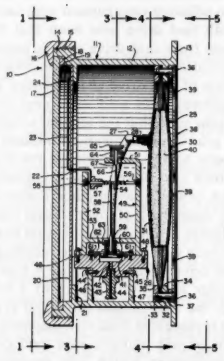
ATMOSPHERIC PRESSURE RATE OF CHANGE INDICATOR

Richard D. Cummins, Hamburg, N.Y., assignor to Carleton Controls Corporation, East Aurora, N.Y.

Filed Feb. 28, 1974, Ser. No. 446,691

Int. Cl.[2] G01W *1/00*

U.S. Cl. 73—170 R **5 Claims**



1. An atmospheric pressure rate of change indicator, comprising:

a sealed housing having a chamber therewithin and provided with an opening therethrough communicating said housing chamber with the atmosphere;

dampening orifice means operatively arranged in said housing opening and adapted to permit pressure of air within said housing chamber to equalize with atmospheric pressure after a period of time;

compartment means arranged within said housing chamber, said compartment means providing an air chamber therewithin and including movable wall means exposed on one side to the pressure of air in said compartment chamber and exposed on its other side to the pressure of air in said housing chamber;

first restricted orifice means establishing communication between said compartment and housing chambers for permitting the pressure of air in said compartment chamber to equalize with the pressure of air in said housing chamber after a period of time; and

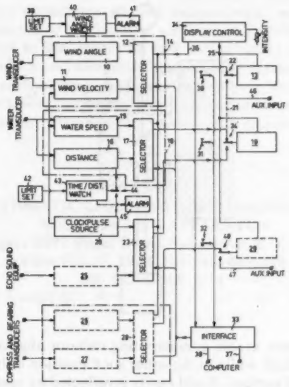
indicator means operatively associated with said movable wall means and responsive to movement thereof for indicating the rate of change of atmospheric pressure, whereby said dampening orifice means may shield said movable wall means from rapid fluctuations in atmospheric pressure.

3,924,465

SHIP NAVIGATION EQUIPMENT

Sverre George Sem-Sandberg, Mariebergsvagen 21, S-136 68 Handen, Sweden

Filed Apr. 4, 1974, Ser. No. 458,009
Claims priority, application Sweden, Apr. 16, 1973, 7305363; Apr. 16, 1973, 7305365
Int. Cl.[2] G01C 21/10
U.S. Cl. 73—181 7 Claims



1. A shipboard navigational information system comprising a plurality of transducing means for sensing navigational parameters and creating an electrical signal dependant on the parameters, there being transducing means to sense at least wind velocity, wind direction and water velocity relative to the ship,

a calculation unit connected to each of said transducing means to convert the output of the transducing means to a digital signal,

at least two selector circuits each receiving input from two of the calculation units and each selecting and storing the output of one of the calculation units,

at least one display circuit receiving input from the selector circuits, and

display control circuit means using time multiplexing to control the operation of the display circuits and the selector circuits to display information corresponding to the navigational parameter selected by the operator.

3,924,466

MAGNETIC FLOWMETER WITH IMPROVED FIELD COIL

Lewis A. Medlar, Oreland, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 21, 1974, Ser. No. 516,647
Int. Cl.[2] G01F 1/58
U.S. Cl. 73—194 EM 19 Claims

1. A magnetic flowmeter comprising in combination:

a flow tube;

a pair of electrical conducting coils for producing a magnetic field;

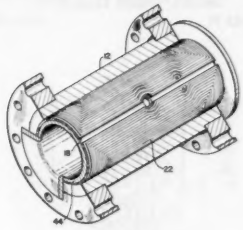
each of said coils comprising a thin pattern of electrical conductors carried by a flexible electrically insulating base;

means securing the flexible base for each of said patterns to said tube;

a magnetic casing surrounding said pair of field coils and providing a magnetic return path therefore;

means for coupling electric power to each of said coils; and

means supporting a pair of probes so that the tip of each



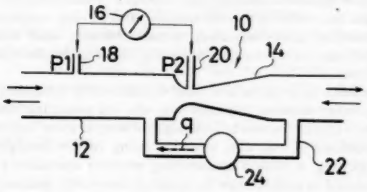
probe is disposed to contact a fluid flowing through said tube.

3,924,467

FLOWMETER

Akio Takamura, Tokyo, and Tsutomu Harada, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Ono Sokki Seikusho, Tokyo, Japan

Filed Dec. 17, 1973, Ser. No. 425,221
Claims priority, application Japan, July 1, 1973, 48-74574; July 1, 1973, 48-74575; July 1, 1973, 48-74576
Int. Cl.[2] G01F 1/44
U.S. Cl. 73—213 12 Claims



1. A flowmeter comprising:

a. two Venturi tubes,

1. each Venturi tube having a throat portion, a first portion tapering at a first cone angle, and a second portion tapering at a second cone angle different from said first cone angle,

2. each tapering portion having a first part of greatest inner cross section remote from said throat portion and a second part of smallest inner cross section connected to the second part of the other tapering portion by said throat portion,

3. the first part of one of said tapering portions of one of said Venturi tubes being joined to the first part of the corresponding tapering portion of the other Venturi tube in a mirror image relationship;

b. means for determining the difference between the fluid pressures in the throat portions of said Venturi tubes;

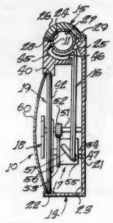
c. two branch conduits having each two ends, one end of each branch conduit communicating with said joined parts, and the other ends of said branch conduits respectively communicating with the first parts of said Venturi tubes remote from said joined parts; and

d. circulating means for circulating fluid through said branch conduits and said throat portions in opposite respective directions.

3,924,468
SHOWER SAFETY COMFORT TEMPERATURE GUIDE

Russell C. Persson, 661 San Felipe St., Salinas, Calif. 93901

Filed June 26, 1974, Ser. No. 483,217
Int. Cl.² G01K 1/14, 5/70
U.S. Cl. 73—343 R 8 Claims



1. A shower safety comfort temperature guide device intended for indicating the temperature of water within a tubular pipeline supplying a showerhead assembly, the device comprising:

a hollow housing;

a clamp pivotally affixed to said housing for detachably affixing said housing to said tubular pipe;

a bimetallic temperature responsive element mounted in said hollow housing, said element having one end thereof secured inside said housing, said one end having a substantial area adjacent said clamp for affording a heat conducting relationship between said tubular pipe and said one end when said housing is clamped to said pipe, the opposite end of said element projecting interiorly of said housing and being a free end movable in said housing in response to temperature changes of said element;

a dial face affixed to said housing and having temperature comfort zone indicating means thereon, said housing defining an opening for affording visual access to said dial face;

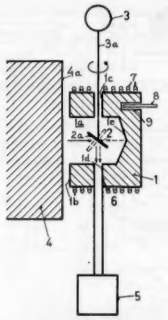
a pointer member and a shaft for rotatably mounting said pointer member adjacent said dial for sweeping rotative movement thereover to designate temperature indicating portions of said dial, said dial being visible through said opening; a motion transmitting member operatively connected to said pointer for rotation therewith, means operatively connected to said free end of said bimetallic element and responsive to movement of said bimetallic element for coacting with said motion transmitting member such that movement of said bimetallic element is transmitted through said motion transmitting member and said coacting means to effect movement of said pointer member for providing visual indication of the temperature of said element which, in turn, is an indication of the temperature of the water flowing through said pipe when said housing is mounted to said pipe.

3,924,469
APPARATUS FOR MEASURING SURFACE TEMPERATURES OF OBJECTS BY INFRARED RADIATION THEREFROM

Gerold Brandli, Windisch, and Pierre Keller, Baden, both of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Mar. 11, 1974, Ser. No. 450,046
Claims priority, application Switzerland, Apr. 30, 1973, 6098/73
Int. Cl.² G01J 5/52, 5/62
U.S. Cl. 73—355 EM 8 Claims

1. Apparatus for measuring the temperature at the surface of an object by measurement of infrared radiation emitted from the surface which comprises a compensating radiator in the form of a body having a good thermal conductivity characteristic, a radiation detector, a planar reflective member located within a cavity provided within said compensating radiator, said reflecting member being mounted at its center on a rotatable shaft extending through a bore in said compensating radiator to the exterior thereof for actuation by a motor to effect cyclic rotational movement about an axis forming an oblique angle to the plane of said reflective member between first and second positions such that in one such position only radiation from the surface of the object entering said cavity is reflected by said reflector member into said detector through

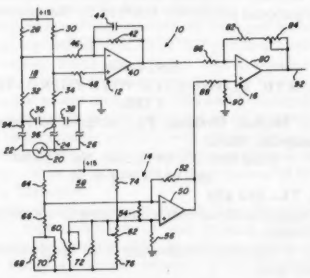


a second bore in said compensating radiator aligned with said rotatable shaft while in the other such position only radiation from a wall surface of said cavity is reflected by said reflective member into said detector thusly admitting radiation from the object and compensating radiator in alternation to said detector, said detector producing at its output a signal determined in accordance with any radiation differential existing between the object and compensating radiator, and means controlled by said output signal for variably heating said compensating radiator in such sense as to reduce said signal to zero thereby to attain a condition of radiation equilibrium as between the object and said compensating radiator.

3,924,470
TEMPERATURE MEASUREMENT CIRCUIT

Duane E. Sander, Brookings, S. Dak., assignor to Daktronics, Inc., Brookings, S. Dak.

Filed Sept. 28, 1973, Ser. No. 401,701
Int. Cl.² G01K 7/24
U.S. Cl. 73—362 AR 10 Claims



1. A measurement circuit comprising:

A. an output amplifier having a positive input and a negative input for providing an output signal representative of temperature and proportional to the difference between a measured signal and a reference signal throughout a measurement range;

B. a measurement amplifier having a positive input and a negative input and having an output connected to one of the inputs of said output amplifier to provide said measured signal to said output amplifier;

C. input means to said measurement amplifier selected to provide balanced impedances to said measurement amplifier positive and negative inputs throughout the measurement range;

D. a thermoelectric transducer for providing a signal representative of temperature to an input of said measurement amplifier; and

E. impedance means having an impedance balanced to the output impedance of said measurement amplifier and connected to the input of said output amplifier not connected to the output of said measurement amplifier to provide a multiamplifier temperature measurement circuit each of the amplifiers of which have balanced input impedances throughout the measurement range whereby the circuit is temperature stable over long periods of time.

3,924,471

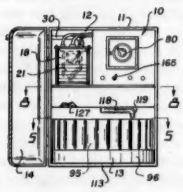
AUTOMATIC LIQUID SAMPLE TAKING AND SEGREGATING APPARATUS

Ernst Singer, 3491 Puget Drive, Vancouver, B. C., Canada

Filed Feb. 7, 1974, Ser. No. 440,294

Int. Cl.[2] G01N *1/14*

U.S. Cl. 73—421 B **14 Claims**



1. Apparatus for taking and segregating measured samples of liquid with or without solids therein, comprising a closed metering chamber, a volume control tube extending down into the chamber and having a lower end positioned above the bottom of the chamber, an inlet tube connected to the control tube for directing fluid into the chamber through said control tube, a liquid outlet tube opening into the chamber at the bottom thereof, valve means for closing and opening said outlet tube, means for selectively operating said valve means to open and close the outlet tube, a source a positive and negative pressure operatively connected to the chamber near the top thereof, control means for causing said source selectively to apply pressure and suction to the chamber, a liquid level controller for the chamber and connected to said source control means to operate said source to shut off the suction and to start the pressure when the liquid sample in the chamber reaches a predetermined level above the lower end of the control tube, said suction drawing liquid samples through the control tube into the chamber when the outlet tube is closed until stopped by the level controller and said pressure blowing liquid out through the control tube until the liquid reaches the lower end thereof and while the outlet tube is closed and out through said outlet tube when the outlet tube is open, a plurality of sample bottles mounted along a path and each having an entrance opening, and liquid distributing means connected to the outlet tube for receiving said expelled samples and mounted for movement along said path to successively direct the samples into the bottles.

3,924,472

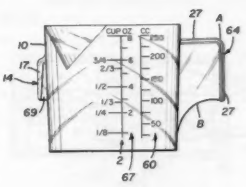
MEASURING DEVICE

Janet E. Harris, P.O. Box 2819, West Palm Beach, Fla. 33402

Filed May 28, 1974, Ser. No. 474,134

Int. Cl.[2] G01F *19/00*

U.S. Cl. 73—426 **3 Claims**



1. A measuring container having in combination, a cup, said cup having an open top with an upper edge, a fastening means fixed to said cup for mounting said cup at a viewing level, said cup including a measuring scale and being transparent so that the level of contents in said cup can be viewed therethrough, a handle fixed to said cup diametrically opposite from said fastening means, a spout on said cup, one side of said spout having its upper edge extending substantially tangentially from the upper edge of said cup above said fastening means, the other side of said spout having its upper edge extending at approximately 90° to the one side, the other side of said spout having its upper edge extending tangentially from the upper edge of said cup, cover means for said cup including its spout.

3,924,473

BALANCING APPARATUS, ESPECIALLY WHEEL BALANCING APPARATUS

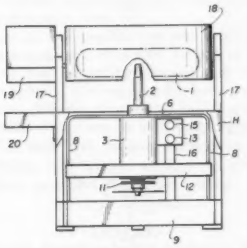
Otfrid Maus, Darmstadt, Germany, assignor to Firma Carl Schenck AG, Darmstadt, Germany

Filed Feb. 27, 1975, Ser. No. 553,596

Claims priority, application Germany, Nov. 11, 1974, 2453292

Int. Cl.[2] G01M *1/22*

U.S. Cl. 73—471 **11 Claims**

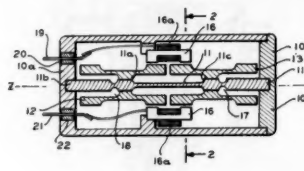


1. A wheel balancing apparatus comprising a base, inverted U-shaped support means including a horizontal member forming a torsion spring and vertically extending spring legs having lower ends secured to said base, said legs having upper ends interconnected by said horizontal torsion spring member, bearing means secured to said horizontal torsion spring member, a rotatable shaft for rotating a wheel to be balanced, said rotatable shaft being vertically supported by said bearing means, horizontally extending bending spring means interconnecting said bearing means with said vertically extending legs of said U-shaped support means, and measuring transducer means operatively arranged for sensing unbalance values of a wheel rotated by said rotatable shaft.

3,924,474
ANGULAR RATE SENSOR

Bernard Friedland, West Orange, and John C. Stiles, Morris Plains, both of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Nov. 12, 1974, Ser. No. 523,174
Int. Cl.² G01C 19/56
U.S. Cl. 73—505 4 Claims

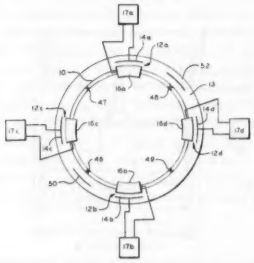


1. An angular rate sensor for measuring the angular rate of change about a reference axis comprising:
   a. a housing;
   b. an elongated flexible vibrating rod secured at both ends in said housing and having first and second nodal points proximate to its ends equidistant from the center of the rod;
   c. fluid damping means filling said housing;
   d. a first inertia means operative on the first nodal point of said rod; and
   d. first and second inertia means operative on the first and second nodal points, respectively, for adjusting the natural frequency of said rod and the position of said nodal points, whereby the nodal points may be adjusted to lie beyond the ends of said rod and said rod decoupled from external vibrations.

3,924,475
VIBRATING RING GYRO

John C. Stiles, Morris Plains, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Oct. 23, 1973, Ser. No. 408,314
Int. Cl.² G01C 19/28
U.S. Cl. 74—5.6 A 21 Claims

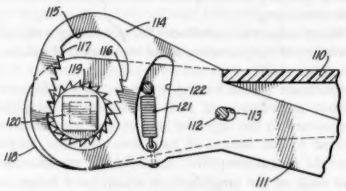


1. The method of providing an indication of the rotation about an axis of a gyroscopic element comprising the steps of:
   a. supporting a thin-walled ring to substantially prevent motion thereof in any direction other than rotation about the ring axis;
   b. vibrating said ring to set up nodes of vibration;
   c. establishing fixed reference positions for said nodes;
   d. rotating said ring to move said nodes to said reference positions in response to a relative rotation of said ring and said reference positions; and
   e. indicating the amount and directions of rotation required to move said nodes back to said reference positions.

3,924,476
DRIVING GEAR AND FEEDING MECHANISM

Robert M. Wolcott, 750 W. Christie, Banning, Calif. 92220

Filed Feb. 25, 1974, Ser. No. 445,097
Int. Cl.² F16H 9/04
U.S. Cl. 74—30 2 Claims

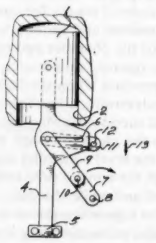


1. A driving mechanism comprising a rotatably mounted wheel, said wheel having a plurality of teeth extending around its periphery, an actuator having a first set of complementary teeth disposed on one side of said wheel and a second set of complementary teeth directed oppositely from said first set and disposed on the opposite side of said wheel, each of said teeth of said wheel and actuator having a radially directed drive face and an angularly directed cam face, the drive faces of said sets of teeth on said actuator being adapted to selectively engage the drive faces of the teeth on said wheel to cause rotational movement of said wheel in a single direction in response to longitudinal movement of said actuator in either direction with respect to said wheel, said teeth being constructed and arranged so that when the teeth on one side of said wheel are fully engaged with one set of teeth of said actuator, the teeth on the opposite side of said wheel barely clear the set of teeth on the opposite side of said actuator, whereby upon reversal of the direction of longitudinal movement of said actuator with respect to said wheel at any longitudinal position of said actuator with respect to said wheel, the cam faces of said teeth automatically engage to provide camming movement of the engaged set of teeth of said actuator out of engagement with the teeth of said wheel and movement of the unengaged set of teeth of said actuator into engagement with the teeth of said wheel, said cam faces also automatically acting upon rotational movement of said wheel in the driven direction other than by movement of said actuator to move said wheel into simultaneous locking engagement with the teeth on both sides of said actuator to prevent further rotational movement of said wheel in the driven direction.

3,924,477
CRANK MOVEMENT MECHANISM

William Portelance, 510 Salaberry, Mont-Laurier, Quebec, Canada

Filed July 1, 1974, Ser. No. 484,969
Int. Cl.² F16H 21/72
U.S. Cl. 74—44 6 Claims



1. A crank movement mechanism comprising an actuating member, means laterally restraining the latter to substantially

exclusive rectilinear displacement thereof, said actuating member having a guideway longitudinally extending transversely to said direction of rectilinear displacement, a crank having an axis of rotation, a rotating arm pivoted at one end about an operatively fixed pivot axis, a connecting rod pivoted at one end to said crank and adapted to actuate the latter, a pivotal connection pivotally connecting the other end of said rotating arm to the other end of said connecting rod, slidable along said guideway, defining a second pivot axis for the rotating arm, and producing lateral displacement of said other end of the connecting rod transversely of the actuating member, and said axes extend transversely to the direction of rectilinear displacement and to the guideway.

3,924,478
SPEED REDUCTION MECHANISM

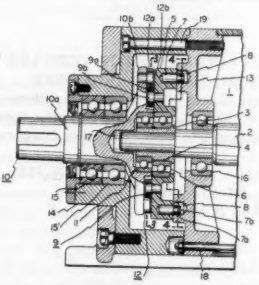
Isamu Takasu, Tokyo, Japan, assignor to Toyo Glass Machinery Company, Ltd., Japan

Continuation of Ser. No. 416,104, Nov. 15, 1973. This application Jan. 30, 1974, Ser. No. 437,787

Claims priority, application Japan, Nov. 18, 1972, 47-115244. The portion of the term of this patent subsequent to Sept. 9, 1992, has been disclaimed.

Int. Cl.² F16H *21/12*

U.S. Cl. 74—63 **5 Claims**



1. A speed changer comprising;

a driving shaft defining an axis and disposed for rotation at a first speed about said axis;

an eccentric boss secured to and rotatable with the shaft;

an intermediate disc pivoted on said boss, locked against rotation, and mounted for circular movement in a closed path;

means for converting the rotation of said boss into the circular movement of the disc;

a driven disc mounted for rotation about said axis of said shaft; and

means for converting the circular movement of the disc into rotation of the driven disc at a speed different from said first speed, comprising a number of first lugs mounted on one of said discs and equally circumferentially spaced apart to define a first circle, a different number of second lugs mounted on the other disc and equally circumferentially spaced apart to define a second circle, one of said circles being disposed generally within the other, and the first and second lugs being disposed to approximately tangentially bear on one another individually and sequentially in driving contact of the lugs on the intermediate disc with the lugs on the driven disc.

3,924,479
BRAKE MECHANISM TO PREVENT REVERSE ROTATION OF A DRIVE SPINDLE

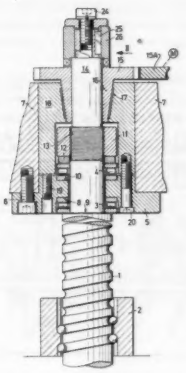
Horst Lanzenberger, Munich, Germany, assignor to Friedrich Deckel Aktiengesellschaft, Munich, Germany

Filed Mar. 4, 1974, Ser. No. 447,923

Claims priority, application Germany, Mar. 7, 1973, 2311307

Int. Cl.² F16H *27/02*

U.S. Cl. 74—89.16 **6 Claims**



1. A brake mechanism for preventing the reverse rotation of a nonself-locking axially movable and rotatable drive spindle upon which a load is applied, comprising:

support means having said drive spindle rotatably mounted therein and a first friction surface thereon;

a drive gear having teeth thereon mounted on said drive spindle, said drive gear being axially movable with respect to said drive spindle and having second friction surface means thereon movable into and out of engagement with said first friction surface;

drive means positively drivingly coupled to said teeth on said drive gear for driving said drive spindle;

a first cam surface secured to said drive spindle and being rotatable therewith; and

a second cam surface mounted on said drive gear and positioned to engage said first cam surface in response to a relative rotation occurring between said drive gear and said drive spindle, said engagement between said first and second cam surfaces effecting an axial movement of said second friction surface on said drive gear into engagement with said first friction surface on said support means during said relative rotation to effect a braking of said drive gear and said drive spindle.

3,924,480
CONSTANT HORSEPOWER VARIABLE SPEED REVERSING TRANSMISSION

Joseph Carapellucci, Broomall, Pa., assignor to Diamond Seven, Inc., Springfield, Pa.

Filed Sept. 11, 1974, Ser. No. 505,079

Int. Cl.² F16H *55/52, 1/38*

U.S. Cl. 74—230.17 A **13 Claims**

1. A constant horsepower variable speed reversing transmission, comprising:

a. an input shaft;

b. an output shaft spaced from said input shaft;

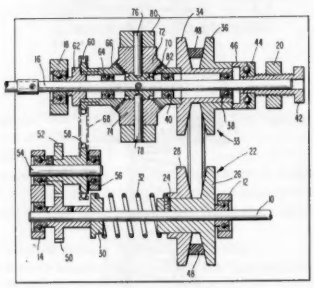
c. a variable speed transmission having: a first portion; a second portion; and connecting means engaging said portions to rotate said second portion at a speed depen-

dent upon the speed of said first portion; said first portion engaging said input shaft to rotate in response thereto;

d. drive means having a first portion engaging said input shaft for rotation therewith and a second portion rotationally driven in response to the rotation of the first portion thereof;

e. a bevel gear connected to said second portion of said variable speed transmission for rotation therewith;

f. a cage comprising a ring having at least one bevel gear engaged with said first mentioned bevel gear, a supported therein for rotation about its axis;



g. an additional bevel gear engaging the bevel gear supported within said cage; and

h. force transmission means coacting with and engaging said cage, said second portion of said driven means, said additional bevel gear, and said output shaft to transmit the force necessary to rotate said output shaft in response to rotation of said input shaft;

i. the ratio of said gears being such as to rotate said output shaft in either forward or reverse depending on the speed of rotation of said variable speed transmission.

3,924,481

CIRCULAR SIDE POSITIVE DRIVE BELT TEETH

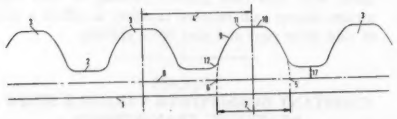
Michael J. W. Gregg, Antrim, Northern Ireland, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed July 3, 1974, Ser. No. 485,642

Claims priority, application United Kingdom, July 20, 1973, 34840/73

Int. Cl.² F16G *1/00, 5/00*

U.S. Cl. 74—231 C **6 Claims**



1. An endless synchronous drive belt formed of a resilient elastomer comprising: at least one high elastic modulus reinforcing member extending along said belt thereby defining a pitch line; a succession of identical teeth uniformly spaced apart by their pitch P and possessing a notional tooth width W, less than P; each tooth having substantially identical fore and an aft surfaces with at least part of said fore and aft surfaces shaped in cross section as the arc of a circle of radius W; both said arcs being centered on the pitch line at centers spaced at a distance W apart.

3,924,482

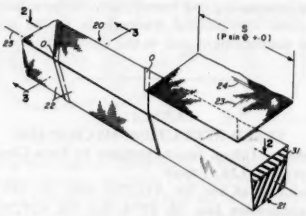
ENDLESS POWER TRANSMISSION BELT AND METHOD OF MAKING SAME

Roger D. Meadows, Waynesville, N.C., assignor to Dayco Corporation, Dayton, Ohio

Filed Jan. 10, 1974, Ser. No. 432,276

Int. Cl.² F16G *5/08*

U.S. Cl. 74—234 **12 Claims**



1. An endless power transmission belt having a belt body and a woven cover therefor in the form of an elongated strip having warps and wefts therein, said warps extending parallel to the length of said strip, said strip being disposed in a helical pattern around said body so that said strip and thus its warps are arranged at an angle relative to a central longitudinal axis through said belt to provide said woven cover as a bias cover which is in a relaxed condition.

3,924,483

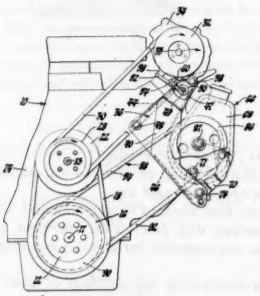
BELT DRIVEN ACCESSORY FOR VEHICLES WITH AUTOMATIC BELT TENSIONER

Frank H. Walker, Grand Blanc; Larry D. Blumer, Swartz Creek; Robert N. Khouri, and David G. Fulks, both of Flint, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 25, 1974, Ser. No. 526,515

Int. Cl.² F16H *7/12, 7/10*

U.S. Cl. 74—242.11 R **4 Claims**



1. A drive system for vehicle accessories comprising first pulley means rotatably mounted in a predetermined position in a vehicle, motor means, means drivingly connecting said motor means to said first pulley means, an accessory, support means in the vehicle for said accessory, pivot means mounting said accessory for limited turning movement on said support means, second pulley means drivingly connected to said accessory and secured thereto for turning movement with said accessory on said pivot means, flexible drive belt means operatively mounted on said first and second pulley means to permit said first pulley means to drive said second pulley means, said belt means having a tight side feeding from said second pulley means onto said first pulley means and further

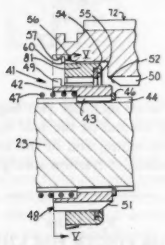
having a loose side feeding from said first pulley means onto said second pulley means, said pivot means being positioned relative to said tight side of said belt means to provide a reaction to the force exerted by said tight side of said belt means when driven by said first pulley means, and spring means operatively connected to said accessory for automatically turning said accessory so that said center of said second pulley means is yieldably urged from the center of said first pulley means to tension said loose side of said belt means for all torque loads of said accessory.

3,924,484

SENSOR UNBLOCKING RAMPS

Elmer A. Richards, Oshtemo, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 20, 1974, Ser. No. 452,726
Int. Cl.[2] F16H *3/08*; **F16D** *13/20, 21/00*
U.S. Cl. 74—331 **10 Claims**



1. In a transmission system including a main shaft and at least one countershaft, multiple pairs of shiftable ratio gears arranged between said main shaft and said countershaft, with jaw clutch devices for connecting at least one of at least some of said pairs of gears to one of said shafts and said jaw clutches including at least one resiliently loaded jaw clutch element being constantly resiliently urged toward engagement position and positively limited in its response to such urging, the improvement comprising:

a blocker ring positioned between said last-named jaw clutch element and the gear with which it is operatively associated and first friction means operative between said blocker ring and said jaw clutch element providing a significant axial drag between said blocker ring and said jaw clutch element without providing appreciable relative rotational drag therebetween and second friction means effective for causing rotation of said blocker ring with said gear upon axial urging of said blocker ring toward said gear in response to initiation of a clutching movement by said jaw clutch element toward said gear;

whereby said blocker ring will normally rotate with said gear upon initiation of a clutching sequence and before axial engagement thereof by the teeth of said jaw clutch element.

8. In a transmission system including a main shaft and at least one countershaft, multiple pairs of shiftable ratio gears arranged between said main shaft and said countershaft, with jaw clutch devices for connecting at least one of at least some of said pairs of gears to one of said shafts and said jaw clutches including at least one resiliently loaded jaw clutch element being constantly resiliently urged toward engagement position and positively limited in its response to such urging, the improvement comprising:

a blocker ring positioned between said last-named jaw clutch element and the gear with which it is operatively associated, said blocker ring encircling said last-named jaw clutch element for normal rotation therewith and first and second friction means effective for causing rotation of said blocker ring with said gear in response to initiation of a clutching movement by said jaw clutch element relative to said gear, said first friction means effective to apply an axial force for engaging said second friction means without applying a significant rotational drag on said jaw clutch element in response to relative axial movement between said blocker ring and said jaw clutch element;

said blocker ring having radially projecting blocker teeth and said last-named jaw clutch element having radially projecting teeth arranged for interference with said blocker teeth upon relatively axial movement therebetween when said blocker ring is in other than a condition of synchronous rotation with said jaw clutch element and for passage axially therebetween when the rotative speed of said blocker ring crosses that of said jaw clutch element and

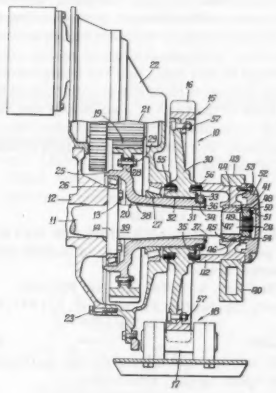
the end faces of said blocker teeth facing said interfering tooth of said jaw clutch element being sloped with respect to a plane normal to the axis of said blocker ring.

3,924,485

FINAL DRIVES WITH LOAD SEPARATING MEANS

Samuel I. Caldwell, Aurora; Robert S. Orr, Pekin, both of Ill., and Duane D. White, Bloomington, Minn., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed July 15, 1974, Ser. No. 488,573
Int. Cl.[2] B26D *55/12*
U.S. Cl. 74—410 **8 Claims**



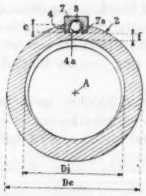
1. In a drive structure having a driver gear, a driven member, a shaft having an inner portion and an outer load support portion, and shaft support means rigidly supporting said inner portion of the shaft, the improvement comprising: mounting means rotatably mounting said driver gear coaxially about said inner portion of the shaft and having a portion extending outwardly in spaced coaxial relationship with said shaft; and means mounting said driven member to said mounting means portion for rotation with said driver gear, said driven member being disposed coaxially outboard of said driver gear, whereby load forces acting on said outer portion of the shaft are effectively isolated from said driver gear.

3,924,486

SCREW AND NUT TRANSMISSION MECHANISM

Jacques Taillardat, Saint Alban-en-Leysse, France, assignor to La Technique Integrale, Chambery, France

Filed Oct. 30, 1973, Ser. No. 411,120
Claims priority, application France, Oct. 30, 1973, 73.38458
Int. Cl.² F16H 1/20
U.S. Cl. 74—459 3 Claims



1. Screw and nut mechanism for converting a movement of rotation into a movement of translation, and vice versa, comprising a screw member and a mating nut member having a common axis, each of said members having at least one peripheral helical groove, which grooves define together at least one helical channel having two ends, a train of balls of predetermined diameter engaged in said helical channel for transmitting forces between said members, at least one substantially straight keyway in the outer peripheral surface of said nut member, said keyway extending parallel to the common axis of said numbers and having side walls spaced apart a width distance, and a floor intermediate said side walls, said keyway having depth in the radial direction less than one-half of said diameter of said balls, an elongated key having side walls spaced apart a width distance corresponding to that of said keyway, and intermediate said side walls a bottom surface including therein a longitudinal channel having cross-section permitting passage of said balls, said key being secured in said keyway with the bottom surface and groove therein facing and adjacent said floor of the keyway, said groove and floor defining a partial ball-recirculation passage including two ends, and connection means for interconnecting the ends of said passage with the ends of said helical channel.

3,924,487

CABLE TRACTION AND RELEASE DEVICE

Roger Huret, and Jacques Huret, both of avenue Felix Faure, 92000 Nanterre, France

Filed Nov. 4, 1974, Ser. No. 520,951
Claims priority, application France, N 73, 73.39609
Int. Cl.² B62D 1/20
U.S. Cl. 74—489 11 Claims

1. In a cable traction and release device, particularly for a bicycle change speed device, comprising,

a control lever having a transverse opening,

a cable with which the control level co-operates,

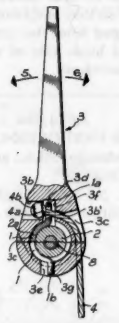
a fixed supporting axle in the form of a drum about which the lever pivots and which is located in said transverse opening,

the drum being arranged to be fixed to a part of a bicycle such as a bicycle frame,

an immobilization system intended to hold an end of the cable in a selected position on application of a tractive force to the cable by an adjusting spring incorporated in the change speed device,

a friction mechanism including a cylindrical helical spring which presses on the drum, incorporated in the immobilization system, one end of the spring co-operating with said lever;

improvement wherein one of two ends of the friction spring is connected directly to one end of the cable in such a way that any traction applied to said one end of the spring in a direction towards another end of the cable tends to press the spring into the drum,



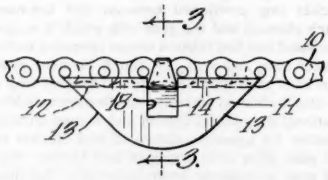
and the control lever includes two lugs each of which is associated with an end of the said spring and is able to urge the corresponding end of the spring in one of two opposing directions of friction spring disengagement.

3,924,488

LIMIT STOP OR FINGER FOR CHAIN OR BELT CONTROL

Edward I. Fox, Chicago, Ill., assignor to H. W. Crane Company, Maywood, Ill.

Filed July 15, 1974, Ser. No. 488,292
Int. Cl.² F16H 53/00
U.S. Cl. 74—568 R 1 Claim



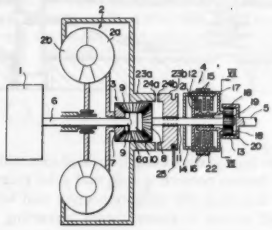
1. In combination with an elongated control member having longitudinally spaced elements, an actuator member positioned at one side of said control member and adapted to be located at any of a plurality of positions spaced longitudinally thereon, and means for connecting the actuator member to the control member in any said spaced positions comprising a U-shaped member having spaced arm portions joined by a cross portion, the arm portions shaped to embrace opposite sides of the control member and each arm portion having a hook end adapted to engage between said longitudinally spaced elements, and a screw bolt extending through said cross portion for clamping the connecting means to the actuator member and also clamping said hook ends to the actuator in any located position of the actuator on the control member, the actuator member having an elongated side adapted to be positioned against one side of the control member and recessed intermediate the ends of said elongated side to receive the U-shaped member.

3,924,489

DIFFERENTIAL TYPE AUTOMATIC SPEED CHANGING APPARATUS INCLUDING VARIABLE SPEED TORQUE CONVERTER

Shoji Yasuda, 11-15 Kamiosaki 3-chome, Shinagawa, Tokyo, Japan

Filed Apr. 29, 1974, Ser. No. 464,951
Claims priority, application Japan, May 2, 1973, 48-49559
Int. Cl.[2] F16H 47/08
U.S. Cl. 74—688 17 Claims



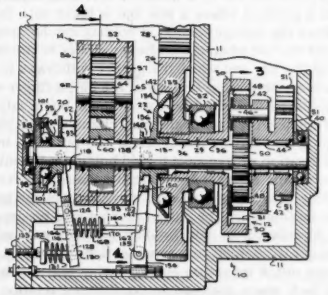
1. Differential automatic speed changing apparatus comprising a rotatable drive shaft and a rotatable driven shaft, variable speed fluid coupler means between said drive and driven shafts for imparting rotation from the former to the latter, said variable speed fluid coupler means including drive and driven elements operatively coupled together by a liquid, differential gearing means coupled between said variable speed fluid coupler means and said driven shaft for imparting rotation to the latter in conjunction with said variable speed fluid coupler means, said differential gearing means including first gear means connected to said drive element, said differential gearing means further including second gear means connected to said drive shaft and said driven element, said differential gearing means further including third gear means connected to said driven shaft, and said second gear means being between and in meshed relationship with said first and third gear means.

3,924,490

VARIABLE RATIO DRIVE UNIT AND METHOD

Ned D. Mills, 2725 Riverside Drive, West Richland, Wash. 99352

Filed May 21, 1974, Ser. No. 471,904
Int. Cl.[2] F16H 3/74, 57/10
U.S. Cl. 74—752 E 26 Claims



1. A variable ratio drive unit comprising a rotary planetary gear carrier, planetary gear means mounted on said rotary planetary gear carrier, rotary sun gear means supported for rotation in meshing engagement with said planetary gear means so as to be rotatable by said planetary gear means, power input drive means drivingly engaged with said planetary gear means, a power output drive means drivingly connected to said rotary planetary gear carrier, a first automatic control means responsive to the rate of rotation of said sun gear for maintaining a constant rate of rotation of said sun gear in response to the sun gear reaching a predetermined rate of rotation and second automatic control means for overriding the first automatic control means in response to said input drive means reaching a predetermined power input rate of rotation for reducing the rate of rotation of the sun gear as the rate of rotation of said input drive means increases above said predetermined power input rate of rotation to provide a minimum gear ratio between said power input drive means and said power output means.

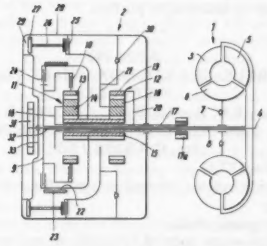
17. A method of automatically varying the input to output gear ratio from an infinite value to a desired minimum value in a variable speed power transmission unit of the type having a power input gear meshing with planetary gears mounted on a rotary planetary gear carrier, a sun gear meshing with the planetary gears and drivingly connected to a gear pump having a fluid inlet and a fluid outlet with valving means in the fluid outlet and a power output gear drivingly connected to the planetary gear carrier, said method comprising the steps of automatically sensing the speed of rotation of the gear pump and the power input gear, initially operating the valving means in the fluid outlet under the sole control of the sensed speed of rotation of the pump to throttle the outlet of the pump in proportion to the speed of rotation of the pump to initially vary the gear ratio from an infinite value to an intermediate value, discontinuing control of the valving means by the speed of rotation of the pump and initiating control of the valving means by the sensed speed of rotation of the power input gear to vary the gear ratio from said intermediate value to said predetermined minimum value by further throttling the output of said pump in proportion to increase in the speed of said power input gear as the speed of said power input gear increases until the pump is substantially completely throttled and said minimum gear ratio is achieved.

3,924,491

HYDRODYNAMIC-MECHANICAL TRANSMISSION FOR AUTOMOBILES

Manfred Kalversberg, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Apr. 24, 1974, Ser. No. 463,821
Claims priority, application Germany, May 30, 1972, 2327471
Int. Cl.[2] F16H 57/10, 3/44
U.S. Cl. 74—763 5 Claims



1. A hydrodynamic-mechanical transmission having a torque converter and a planetary gear system enclosed in a gear housing and controlled by servo pressure from a pump located on an interior end wall of the gear housing, the planetary gear system comprising:

first and second simple planetary gear sets;

a clutch housing;

a forward clutch concentrically above the first planetary set and being concentrically enclosed by the clutch housing,

the forward clutch connecting a turbine shaft of the torque converter with a ring gear of the first planetary set upon actuation of the forward clutch;

a multiple-disc brake acting on a planet carrier of the second planetary set to halt its rotation upon actuation of the brake, the brake being arranged concentrically above the clutch housing, the forward clutch and the first planetary set;

a grip roller freewheel acting as an overrunning brake on the planet carrier of the second planetary set, the freewheel being arranged concentrically above the second planetary set; and

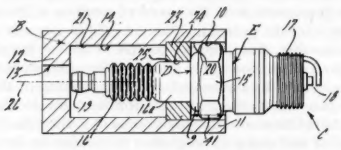
a cylindrical piston for actuating the multiple-disc brake concentrically surrounding the clutch housing, said piston being designed to be moved by pressure from an annular cylinder servo pressure space, defined by the pump and the gear housing and arranged concentrically above the oil pump.

3,924,492

SPARK PLUG SOCKET WRENCH

Stewart V. Bray, Allen Park, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed June 28, 1972, Ser. No. 266,914
Int. Cl.[2] B25B *13/06*
U.S. Cl. 81—121 R **4 Claims**



1. A hollow tool for use in the installation of spark plugs of the type having at least one bearing surface and having a fragile portion adjacent the bearing surface and about which said tool extends, said tool comprising:

a body having a plug-receiving stepped bore therein, a first step thereof having a configuration effective to mate with said bearing surface, a second step thereof spacedly surrounding said fragile portion when said first step mates with said bearing surface, and

a radially inwardly directed non-resilient protuberance on said body effective to engage said spark plug at a location substantially at the juncture between said bearing surface and said fragile portion whereby skewing forces between said bearing surface and tool may be more effectively resisted by said fragile portion.

3,924,493

QUICK RELEASE EXTENSION SHAFT FOR SOCKET WRENCHES

John Penner, P.O. Box 63, Byers, Colo. 80103

Filed Oct. 21, 1974, Ser. No. 516,283
Int. Cl.[2] B25B *13/00*
U.S. Cl. 81—177 G **5 Claims**

1. A quick release extension shaft for socket wrenches comprising:

a. an elongated shaft,

b. an axial recess formed internally of said extension shaft projecting substantially along the axis of said extension shaft,

c. a socket drive stud formed in one end of said extension shaft,

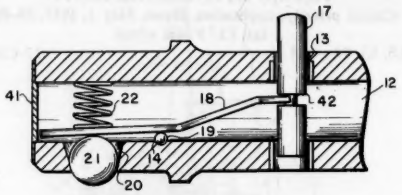
d. a socket retaining means projecting from said socket drive stud, said socket retaining means further comprising:

1. a transverse slot projecting into said socket drive stud,

2. a lock socket engaging member mounted in said transverse slot,

3. said lock socket engaging member including a lock socket engaging pin projecting from the surface of said socket drive stud, and

4. a spring urging said lock socket engaging pin outward of said socket drive stud in a manner adapted to engage a lock socket,



e. a release button projecting from said extension shaft, said release button projecting into said axial recess, and

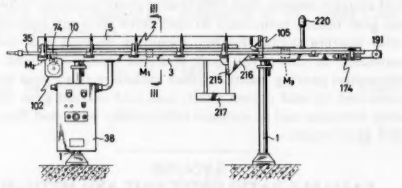
f. an arm mechanically interconnecting said release button and said socket retaining means retracting said socket retaining means responsive to pressure applied to said release button.

3,924,494

AUTOMATIC BAR FEEDING APPARATUS

Shiro Azuma, Kokubunji, Japan, assignor to Azuma Engineering Co., Ltd., Tokyo, Japan

Filed June 25, 1974, Ser. No. 483,060
Int. Cl.[2] B23B *13/00;* **B23Q** *5/22*
U.S. Cl. 82—2.7 **3 Claims**



1. An automatic bar feeding apparatus which comprises a mechanism to take a new bar from a storage section to a guide section, a pusher movable reciprocably in the axial direction in the guide section, a driving motor which advances the pusher to push the bar to a machine tool and withdraws the pusher to a position where a new bar is taken into the guide section from the storage section, a holding mechanism operative to hold the bar when the pusher advances to connect with the end of the bar and when the pusher withdraws to detach from the remaining scrap portion of the bar, a finger which is rotatably joined to the pusher, said finger being adapted to hold and release the end of the bar, characterized by means for stopping said driving motor when said pusher is in predetermined position with respect to said holding mechanism, and a motive means connected to simultaneously operate both said holding mechanism and said movement of the pusher in the guide section when the pusher reaches said predetermined position in relation to said holding mechanism, said finger being rotatably coupled to a joint section, the said joint section having notch means on an end facing rearwardly of said finger, a lock piece disposed in confronting relation to said rearward end of said joint section, said lock piece having a front end with protrusion means configured to engage said notch means of said joint section, a threaded push rod extending forwardly at the end of said pusher and having a longitudinally extending groove, said lock piece being slidably received on said push rod with said protrusion means engaging said groove, means on said joint section threadedly engaging said

threaded push rod, and spring means urging said lock piece forward for engagement of said protrusion means with said notch means.

3,924,495

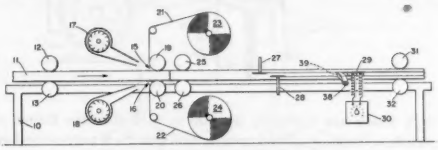
APPARATUS FOR PRODUCING GROOVES IN FOAMED THERMOPLASTIC INSULATION BOARDS

Dikrun DerMarderosian, Sudbury, and Paul Albert Tremblay, Billerica, both of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Division of Ser. No. 314,685, Dec. 13, 1972, abandoned. This application June 24, 1974, Ser. No. 482,142

Int. Cl.² B26D *3/06, 9/00;* **B26F** *3/08*

U.S. Cl. 83—5 **2 Claims**



1. An apparatus for the production of grooved foamed thermoplastic resin insulation board, said apparatus comprising a frame; means supported by said frame for mvoing said board relative to said frame; a pair of spaced, rotatable knives positioned to form two continuous slits in a surface of the board; a tool positioned to work between said slits and to remove resinous board material from therebetween and thereby to form a groove in said surface, said tool having a flat, elongated rectangular bottom having a chisel-shaped leading knife edge tapered on one side to direct board material away from said board and a width corresponding to the distance between said slits, said tool further having upstanding side walls rearward of said leading edge and perpendicular to said bottom; and means to heat said tool to at least the softening temperature of said insulation board.

3,924,496

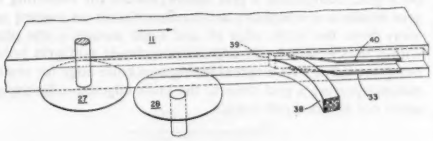
METHOD FOR PRODUCING GROOVES IN FORMED THERMOPLASTIC INSULATION BOARDS

Dikrun DerMarderosian, Sudbury, and Paul Albert Tremblay, Billerica, both of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Division of Ser. No. 314,685, Dec. 13, 1972, abandoned. This application June 24, 1974, Ser. No. 482,143

Int. Cl.² B26D *3/06*

U.S. Cl. 83—5 **3 Claims**



1. The method of forming a groove in a surface of a foamed thermoplastic resin insulation board, said method comprising the steps of first forming a pair of spaced continuous slits in said surface, said slits having a depth corresponding to the depth of the groove to be made in said board; applying a knife-edged tool to the area defined by said slits, said tool having a flat, elongated rectangular bottom having a chisel-shaped leading knife edge tapered on one side to direct board stock away from said surface and a width corresponding to the width of the area defined by said slits, said tool further having upstanding side walls rearward of said leading edge and perpendicular to said bottom; and causing said heated tool to move in said defined area relative to said board while heating said tool to simultaneously soften and separate the portion of foamed material defined by said slits from said board and to direct said separated portion outwardly from said board in the form of a continuous strip.

3,924,497

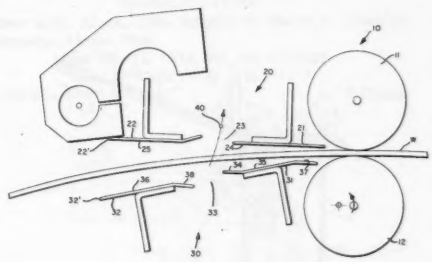
METHOD OF DISPENSING A MICROFOAM SHEET

Joseph D'Angelo, Wyckoff; Lawrence Maccherone, Ringwood, both of N.J., and Frank George Maros, Media, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 19, 1975, Ser. No. 550,988

Int. Cl.² B26F *3/12*

U.S. Cl. 83—16 **5 Claims**



1. A method of dispensing a microfoam sheet of predetermined size including the steps of:

a. positioning the leading edge of a web of microfoam in operative relationship with a web moving means in the form of nip rolls;

b. moving the web by means of the nip rolls between upper and lower members,

the upper member having means defining first and second plates having an aperture therebetween adapted to receive a web cutting means, the first plate having means defining a web holding surface and the second plate having means defining a web clamping surface,

the lower member having means defining first and second plates having an aperture therebetween adapted to receive such web cutting means, the first plate having means defining a web holding surface and a web first guiding surface and the second plate having means defining a web clamping and first guiding surface, which first guiding surfaces of the first and second plates of the lower member are disposed at an angle to the holding and clamping surfaces of the first and second plates of the upper member as the web is moved between the upper and lower members, such angle extending outwardly in the direction of web travel, and the web cutting means being positioned out of contact with the web in an inoperative position as such web is moved between the upper and lower members;

c. moving the web a predetermined length past the web cutting means with the leading edge extending at least beyond the outer edge of the second plates of the upper and lower members;

d. moving the nip rolls out of operative relationship with the web, while simultaneously pivoting the lower member upwardly into an operative position whereby to hold the web between the holding surfaces of the first plates of the upper and lower members and to clamp the web between the clamping surfaces of the second plates of such upper and lower members;

e. cutting the web to form a microfoam sheet of predetermined size by moving the cutting means through the apertures between the plates of the upper and lower members, then returning such cutting means to its original inoperative position;

f. retaining, by friction, the cut sheet between the clamping surfaces of the second plates of the upper and lower members; and

g. pulling the cut sheet from between these second plates of such upper and lower members.

3,924,498

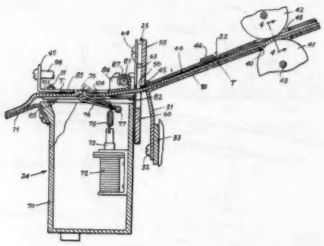
REPEATER TAPE MACHINE

Forrest G. Hill, East St. Louis, Ill., assignor to Marsh Stencil Machine Company, Belleville, Ill.

Filed June 14, 1973, Ser. No. 369,958

Int. Cl.[2] B26D *5/40*

U.S. Cl. 83—58 **13 Claims**



1. In a tape dispensing machine: power-operated means to deliver a strip of tape from a supply to a delivery point; and control means operated by withdrawal of the tape from the delivery point to start the power-operated means to initiate delivery of a subsequent strip of tape from the supply to the delivery point, the power-operated means being electrically operated; circuit means to control energization of the power-operated means including a starting circuit and a running circuit, the means operated by the withdrawal of tape including a first switch in the starting circuit, and a tape-actuated device that opens that switch in response to the presence of tape at the delivery point; the said switch having means to close it when the device responds to the absence of tape at the delivery point; and means operated by energization of the starting circuit to close the running circuit; with means operated by the power operated means to sever the delivered strip of tape; the tape-actuated device having associated therewith feeler means engageable with the tape when tape is present thereat, the feeler means being held by the tape in position to open the switch, electrically-operated means to hold the feeler means out of tape-engaging position when the means to deliver tape is delivering it; means operated upon delivery of the strip of tape and before severance of the tape to cause the electrically operated means to release the feeler means to engage the tape, whereby the feeler does not obstruct delivery of tape but is available to hold the tape strip upon severance.

3,924,499

MACHINE FOR CUTTING CARDS FROM CONTINUOUS STRIPS EMPLOYED IN MULTI-COPYING

Jean Theophile Fortunat Dechambre, 59, Chemin de Rouheid, Heusy; Pierre Jean Simon Lousberg, 10, Chemin de Thiniheid, Stembert, and Joseph Jean Julien Pirard, 35, Avenue du Foyer, Petit-Rechain, all of Belgium

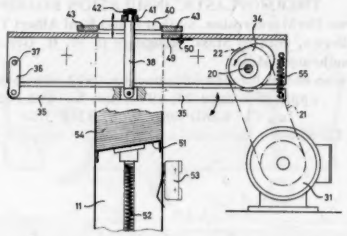
Filed June 14, 1974, Ser. No. 479,589

Claims priority, application Belgium, June 15, 1973, 132328

Int. Cl.[2] B26D *5/22*

U.S. Cl. 83—96 **10 Claims**

1. A machine for cutting cards from a continuous strip employed in multi-copying by a punching operation comprising a machine frame, a punching mechanism supported by said frame, means for serially advancing a pack of cards to a location for punching in the order of presentation, and means for collecting cards which have been cut out by said punching mechanism, said punching mechanism including a plurality of



rods which are vertically slidable in said machine frame, a punch, a frame provided around said punch, a transverse bar coupling said punch to said rods, springs being interposed between said frame and transverse bar to provide an even pressure around the outer periphery of a punched card when the latter has been brought into the punching position.

3,924,500

DEVICE IN A MICROTOME FOR HOLDING A GRID ON WHICH SECTIONS ARE COLLECTED

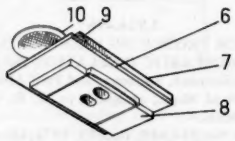
Erik Lennart Kindel, Bandhagen, Sweden, assignor to LKB-Produkter AB, Bromma, Sweden

Filed Aug. 23, 1974, Ser. No. 499,913

Claims priority, application Sweden, Aug. 28, 1973, 7311639

Int. Cl.[2] B26D *7/00*

U.S. Cl. 83—167 **4 Claims**



1. Device for use in microtomes of the type wherein thin sections of material cut by a knife means are to be collected on a grid, comprising a grid holder, means for mounting the grid holder on said knife means for movement toward and away from the knife edge of said knife means in the plane within which said knife edge is contained, said grid holder being provided with a recess facing said knife edge for removably supporting a grid close to the knife edge to collect specimens cut by the knife means.

3,924,501

CUTTING APPARATUS

Morris Cohen; Evelyn V. Cohen, both of Indianapolis, Ind., and Alfred M. Rubio, Chicago, Ill., assignors to Model Builders, Inc., Chicago, Ill.

Filed May 6, 1974, Ser. No. 466,957

Int. Cl.[2] B26D *1/02, 4/18*

U.S. Cl. 83—404.3 **13 Claims**

1. A cutting apparatus comprising:

a frame;

a blade assembly supported by the frame including a plurality of blades;

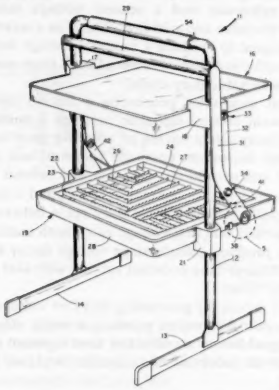
a pusher head slidably attached to the frame having a first position remote from the blade assembly and a second

position adjacent the blade assembly, each blade of the plurality of blades having a serrated edge directed toward the pusher head;

a handle pivotally coupled to both the pusher head and the blade assembly and operable to move the pusher head between its first and second positions in response to angular movement of the handle relative to the frame;

the blade assembly including a blade frame holder rigidly attached to the frame and a first blade frame supported within the holder and including a plurality of blades;

the first blade frame including,



1. first and second originally-curved bars each including a longitudinal clearance slot and a plurality of blade thickness slots essentially perpendicular to their associated clearance slot, the bars being oriented such that the originally-concave sides are facing one another,
2. first and second retaining rods positioned within the clearance slot of the first and second bars respectively, each blade of the plurality of blades having a hole at each end which is engaged by one of the retaining rods within one of the bars, and
3. means for maintaining the first and second bars in an essentially straight configuration and for maintaining tension on the plurality of blades.

3,924,502

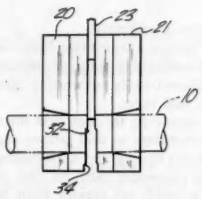
CLAMPING DIE JAW INSERT FOR TUBE CUTOFF APPARATUS

John J. Borzym, Birmingham, Mich., assignor to Alpha Industries, Inc., Detroit, Mich.

Filed Jan. 30, 1975, Ser. No. 545,759

Int. Cl.[2] B26D 7/04

U.S. Cl. 83—454 **7 Claims**



1. For use in a cutoff apparatus of the type having a pair of opposed clamping members for holding a tubular workpiece and a blade which is displaceable along a path of travel which extends through the workpiece proximate the clamping members to sever the workpiece into lengths, each of said clamping members comprising: a body of rigid material having a blade support surface which extends parallel to the path of blade travel and adapted to work in close clearance with the blade over the major portion thereof; a partial aperture intercepting the surface and in opposition to another such partial aperture in the opposite clamping member to clamp the workpiece; and a plurality of relief steps formed in said surface to provide successively greater clearances between the blade and the body as it displaces along the path of travel in the area of the aperture.

3,924,503

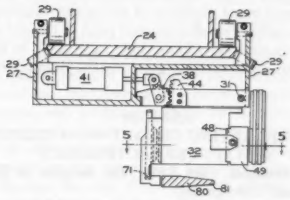
FABRIC CUTTING

Mathew Kuts, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed May 12, 1975, Ser. No. 576,325

Int. Cl.[2] B23D 19/02; B26D 1/20

U.S. Cl. 83—488 **9 Claims**



1. A bias cutting apparatus for cutting rubberized fabric comprising a support frame, a carriage mounted on said support frame for reciprocal movement, drive means connected to said carriage for reciprocating said carriage, a cutter support member pivotally secured to said carriage, a cutter means journaled on said cutter support member for rotation thereon, power means mounted on said carriage operatively connected to said cutter means for rotating said cutter means, said cutter means having a plurality of spaced linear cutting edges, a guide bar secured to the lower portion of said support frame over which fabric is moved and under which a conveyor belt travels, anvil means mounted on said cutter support member for movement therewith, said anvil means having a linear cutting edge, said cutter means having its cutting edges parallel to said linear cutting edge of said anvil means, and power operated means interconnecting said carriage and said cutter support member for pivoting said cutter support member on said carriage to move said cutter support member and anvil away from said guide bar to facilitate the movement of fabric while said cutter support member and carriage are moved back for a subsequent cutting of the fabric.

3,924,504

SHEARING APPARATUS

Albert L. Kurtz, Gates Mills, Ohio, assignor to The Hill Acme Company, Cleveland, Ohio

Filed Aug. 17, 1973, Ser. No. 389,327

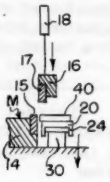
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] B26D 1/00

U.S. Cl. 83—568 **1 Claim**

1. A shearing machine for shearing an associated planar workpiece with relatively low power and without attendant curling of the workpiece comprising, a stationary frame, a stationary knife mounted on said frame, a movable knife, movable knife support means mounting said movable knife for movement toward and away from said stationary knife in coacting shearing relation therewith, a workpiece outboard support anvil disposed adjacent said stationary knife and directly below said movable knife in opposition thereto, and

leaf-spring type anvil mounting means on said frame for yieldably supporting said anvil, said mounting means effecting a constant even equal yield resistance for the anvil as an associated workpiece is sheared thereon by said movable knife in coaction with the stationary knife, said anvil mounting means including an elongated base mounted on said frame, said base



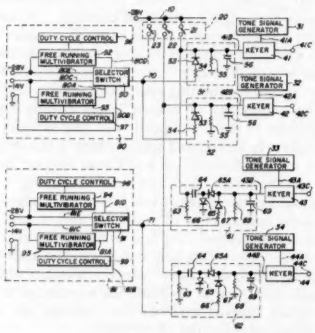
having spaced raised ridges on its upper surface, and an elongated leaf-spring supported at its ends on said ridges respectively, said anvil being disposed on said spring intermediate its ends and providing two-dimensional yield of the anvil thereby effecting a progressively diminishing rake angle as the workpiece is sheared and providing a constant yield resistance.

3,924,505

ELECTRONIC KEYING CIRCUIT WITH SELECTABLE SUSTAIN CHARACTERISTICS

Ray B. Schrecongost, Park Ridge, Ill., assignor to Hammond Corporation, Chicago, Ill.

Filed Nov. 14, 1973, Ser. No. 415,774
Int. Cl.[2] G10H *1/00, 3/00, 1/02*
U.S. Cl. 84—1.01 **8 Claims**



4. In an electrical musical instrument, a tone signal generator and a keying circuit coupled to said generator to produce a keyed tone signal having a selectably variable decay envelope, said keying circuit comprising:

a keyer, including first and second input leads receiving a tone signal and a keying signal, respectively, operative to produce a keyed tone signal having an amplitude proportional to the magnitude of said keying signal;

a time constant circuit having a keying voltage input lead and a keying signal output lead coupled to said second input lead; and

a keying voltage circuit for selectably applying a first voltage to said keying voltage input lead of said time constant circuit;

said time constant circuit including a first resistor and a capacitor coupled to said keying voltage input lead to form a series timing circuit during a terminal portion of an operating interval of said time constant circuit with the junction of said first resistor and said capacitor coupled to said keying signal output lead, a second resistor and a diode coupled in series between said junction and a sustain control terminal, and circuit means for supplying to said sustain control terminal a selectable one of a plurality of sustain control signals comprising:

first circuit means for generating a ground reference voltage as a first sustain control signal to produce a single stage voltage decay signal having an effective time constant depending solely on the values of said capacitor and said first and second resistors;

second circuit means for generating a chopped voltage signal varying with a preselectable duty cycle between ground reference and a second voltage intermediate ground reference and said first voltage as a second sustain control signal to produce a multiple voltage decay signal with the effective time constant of each stage varying with said preselectable duty cycle;

third circuit means for generating a second voltage as a third sustain control signal to produce a multiple stage voltage decay signal having an effective time constant of each stage dependent upon the values of said capacitor, said first and second resistors and said second voltage;

fourth circuit means for generating a chopped voltage signal varying with a preselectable duty cycle between ground reference and said first voltage as a fourth sustain control signal to produce a single stage voltage decay signal having an effective time constant varying with said preselectable duty cycle;

fifth circuit means for generating said first voltage as a fifth sustain control signal to produce a single stage voltage decay signal having an effective time constant depending solely on the values of said capacitor and said first resistor; and

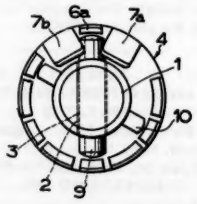
switching circuit means for selectably coupling one of said first through fifth circuit means to said sustain control terminal.

3,924,506

PIN LOCKING DEVICE

Iwao Uozumi, Tokyo, Japan, assignor to Iwatani & Co., Ltd., Osaka, Japan

Filed July 2, 1974, Ser. No. 485,234
Int. Cl.[2] F16B *19/00*
U.S. Cl. 85—8.1 **3 Claims**



1. In a pin fastener assembly:

a fastener pin having a transverse bore therethrough;

a lock washer embracing said pin adjacent said bore and having a diametrically extending groove thereacross aligned with said bore;

a locking pin extending through said bore and having portions complementary to said groove and lying therein to engage the same throughout a substantial area of contact; diametrically opposed tabs on the periphery of said washer, of a width no greater than the corresponding dimension of said locking pin at the ends of said groove and extending across the ends of said locking pin to hold the same in said bore; and

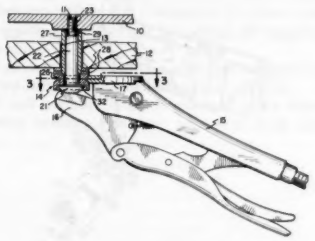
further tabs, on each side of said opposed tabs, substantially wider than said opposed tabs and being bent inwardly to

engage the sides of said locking pin to retain the same in said groove.

3,924,507
FASTENER APPARATUS

Charles C. Faroni, Summit, N.J., assignor to Amerace Corporation, New York, N.Y.

Continuation of Ser. No. 341,824, March 16, 1973, abandoned. This application Feb. 1, 1974, Ser. No. 438,851
Int. Cl.² F16B *19/00, 23/00*
U.S. Cl. 85—9 R **17 Claims**



1. Fastener apparatus comprising:

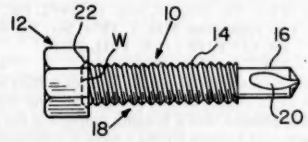
a. a bolt having a head and a shank, at least a portion of said shank being threaded and said head having a smooth non-wrenchable surface; and

b. a cup washer adapted to be rotatably mounted on the shank of said bolt and having side walls which partially enclose the head of said bolt when said cup washer is positioned adjacent said head, said side walls having bearing surfaces thereon for receiving force externally applied in a direction parallel to the longitudinal axis of said bolt when the cup washer is so mounted, whereby an externally applied compressive force can be releasably applied to the exposed portion of the head of the bolt and said bearing surfaces of the cup washer to hold said head and cup washer together so that a torquing force can thereupon be applied to said cup washer to rotate the bolt.

3,924,508
COMPOSITE DRILL SCREW

Charles J. DeCaro, Brighton Township, Beaver County, Pa., assignor to Textron, Inc., Providence, R.I.

Filed Sept. 27, 1974, Ser. No. 510,115
Int. Cl.² F16B *23/00, 25/00*
U.S. Cl. 85—41 **4 Claims**

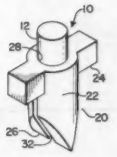


1. An inertia welded composite screw comprising a threaded shank section of a first material terminating in an entry end and a head section of a second material different from the first material, said head section having a recess along a surface thereof, said recess having a greater cross section than the shank cross section, said shank section positioned within the recess and joined to the head section through an inertia weld zone substantially within said recess.

3,924,509
SELF-PIERCING BLIND FASTENER

John Bert Alexander, Hoffman Estates, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Apr. 8, 1974, Ser. No. 458,636
Int. Cl.² F16B *13/06*
U.S. Cl. 85—68 **15 Claims**



1. A self-piercing rivet fastener comprising a rivet body and a drive pin, the rivet body including a shank with an entering end and a trailing end, the entering end including a tapered point, stop surface means extending laterally of the shank at the trailing end thereof, a recess extending axially of the shank from the trailing end and terminating short of the extremity of the entering end, the drive pin and recess including cooperating abutment and wedging surfaces for successively driving and expanding the rivet body as a result of a single driving blow to the drive pin, slot means on the entering end of the shank weakening the shank in a first longitudinal plane extending through the axis of the shank to permit the entering end to expand laterally from the first plane after the entering end extremity has penetrated the workpiece, the trailing portion having a maximum and minimum dimension laterally of the axis of the shank, the maximum dimension incorporated in the stop surface means and being greater than a maximum transverse dimension of the shank, the minimum dimension of the trailing portion extending in a second plane in perpendicular relationship to the first plane, the minimum dimension of the trailing portion being substantially equal to the transverse dimension of the remaining portion of the shank lying in said second plane so that the shank may be supported along substantially its entire length within a driving chamber of an associated fastener driving tool, the drive pin adapted to drive the rivet body through the workpiece and to expand the entering end after the penetration of the entering end through the workpiece.

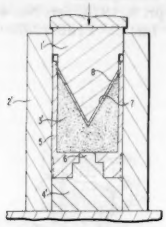
3,924,510
PROCESS FOR THE PRODUCTION OF EXPLOSIVE DEVICES SURROUNDED BY A CASE

Manfred Strunk, Neuenrade; Heinz Kroschel, Troisdorf-Sieglar, and Alfred Voss, Cologne, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

Filed Aug. 9, 1973, Ser. No. 387,039
Claims priority, application Germany, Aug. 10, 1972, 2239281
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² C06B *21/02*
U.S. Cl. 86—1 R **14 Claims**

1. Process for the production of explosive devices surrounded by a case comprising the steps of placing an explosive charge in a matrix mold, moving a pressing tool in a first direction within the mold to apply a force to the explosive charge to compress the charge and form an explosive device of a predetermined shape with mutually opposite end portions, the pressing tool during the movement thereof applying the force to one of the mutually opposite end portions, placing the explosive device within a case having an open end such that the other mutually opposite end portion of the explosive device is arranged proximate thereto, and moving a pressing tool to apply a force to the other mutually opposite end por-

tion of the explosive body within the case such that in the two pressing operations, a pressing tool is effective on the mutually



opposite end portions of the explosive device to provide the explosive device with a uniform density.

3,924,511

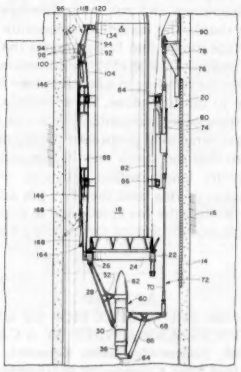
MISSILE SUPPORT SYSTEM

Giles A. Kendall, Burbank; Harish K. Bhutani, Downey, and Robert Minick, Glendale, all of Calif., assignors to Menasco Manufacturing Company, Burbank, Calif.

Continuation of Ser. No. 224,874, Feb. 9, 1972, abandoned. This application Dec. 21, 1973, Ser. No. 427,073

Int. Cl. F41f *3/04*

U.S. Cl. 89—1.8 **24 Claims**



1. A missile support system to protect a missile located in an underground silo against shock damage wherein said system includes:

base support means to support the base of said missile;

cage means to surround a portion of said missile, said cage means fixedly connected to said base support means but substantially spaced thereabove;

lateral support means connected to said cage means, said lateral support means directly contacting the wall of said missile;

said base support means being secured to the wall of the silo by an attachment means, said attachment means including at least three cables equiangularly spaced about said missile, said attachment means to support said missile centrally located and spaced from the silo wall;

said cage means including openings, guide rod means movably mounted in said openings with the direction of the guide rod movement being substantially parallel to the longitudinal axis of the missile, said guide rod means connected to said cables.

3,924,512

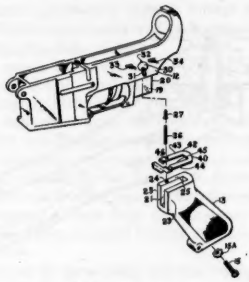
REMOVABLE LOCKPLATE TO PRECLUDE SELECTION OF AUTOMATIC FIRING

Charles R. Fagg, Sherrarde, Ill., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 7, 1974, Ser. No. 467,770

Int. Cl.² F41C *17/08*

U.S. Cl. 89—128 **4 Claims**



1. In a weapon having automatic and semi-automatic selective firing selector lever journalled in a lower receiver of said weapon for rotational movement about a transversely extending axis in said lower receiver, said selector lever having a handle portion and a pointer portion, with both said handle and pointer portions pivotally movable over a sidewall of said lower receiver, said pointer portion having the normal capacity of being selectively directed toward indicia means on said lower receiver sidewall representing safe, semi-automatic and automatic firing conditions of the weapon, and a pistol grip secured to said lower receiver,

a removable lock plate mounted intermediate said pistol grip and said lower receiver, said lock plate having an upstanding lug portion extending adjacent said lower receiver sidewall and in the path of said selector lever handle portion to preclude movement of said pointer portion to its automatic firing position,

so constructed and arranged that automatic capability of the weapon is temporarily eliminated for use in civil disturbance operations.

3,924,513

CONTROL MEANS FOR A FLUID-POWERED DEVICE

Jack B. Ottestad, La Jolla, Calif., assignor to Impulse Products Corporation, San Diego, Calif.

Division of Ser. No. 279,694, Aug. 10, 1972, Pat. No. 3,822,633. This application Mar. 1, 1974, Ser. No. 447,083

Int. Cl.² F01B *11/00;* **F01L** *15/16*

U.S. Cl. 91—224 **4 Claims**

1. Control means for a cyclically operated fluid-powered device such as an impact ram or the like wherein the device has a working plunger, and a housing supporting the plunger for movement, said housing having a surface cooperating with a surface of said plunger to define a triggering chamber therebetween, and means for admitting pressured fluid into said housing including means for supplying admitted fluid to a portion of said plunger to hold said plunger against movement and means for venting fluid from said housing; comprising:

means within said housing defining a charging chamber for receiving pressured fluid and for being charged to a predetermined level with said pressured fluid; valving means operative to hold said triggering chamber open to venting via said venting means, until said predetermined level is

reached, and operative, when said predetermined level is reached, to close off said triggering chamber venting and to direct pressured fluid from said charging chamber into said triggering chamber to cause movement of said plunger; wherein

said valving means includes a wall member movably disposed within said housing, in slidable and sealing engagement with the plunger; and

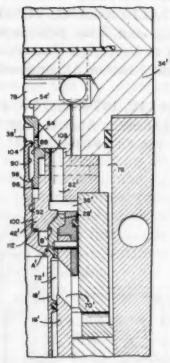
means for resiliently and normally constraining said wall member in a given direction relative to said charging chamber; wherein

said venting means comprises a fluid-conductive passageway open to venting at one end thereof, and opening into said triggering chamber at another end thereof; .

said valving means further includes closure means movably disposed within said passageway to allow venting of said triggering chamber and for closing off triggering chamber venting;

said closure means and said wall member each having pressured-fluid-impingement reaction surfaces;

said wall member reaction surfaces being disposed to receive housing-admitting pressured fluid thereupon to



effect a movement of said wall member in a direction other than said given direction; and

said wall member has probe means cooperative with said closure means and said housing to define a conduit for conducting pressured fluid from said charging chamber to both said reaction surface of said closure means and to said triggering chamber, only upon said wall member having moved a predetermined distance in said other direction commensurate with said charging chamber reaching its predetermined level, to cause said closure means to close off said passageway to halt venting of said triggering chamber, wherein

said wall member comprises a piston;

said probe means comprises an elongated probe, extending from and movable with said piston;

said housing has a bored-through seal base element fixed interpositionally between said charging member and said triggering chamber, and

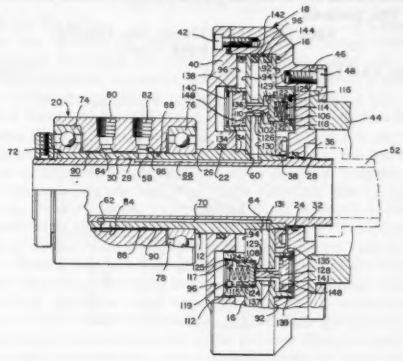
said closure means has at least one triggering port formed therein communicating at one end thereof with said closure means reaction surface and in communication at the other end thereof with said triggering chamber.

3,924,514

APPARATUS FOR ACTUATING A WORK GRIPPING DEVICE

Hubert J. Parsons, Horseheads, and Anders Adolf Peterson, Elmira, both of N.Y., assignors to Hardinge Brothers, Inc., Elmira, N.Y.

Filed Aug. 3, 1973, Ser. No. 385,549
Int. Cl.² F15B *11/08, 13/042*
U.S. Cl. 91—420 **9 Claims**



1. A device for actuating a work gripping collet comprising:

a. a cylinder adapted to be mounted to a machine tool spindle,

b. a tubular through hole collet drawing member being mounted within said cylinder for axial movement relative thereto,

c. annular piston means slideably received in said cylinder and including means for axially moving said member relative to said cylinder,

d. said drawing member passing through said piston means,

e. said piston means having a first pressure face cooperating with one end of said cylinder to form a first expansible chamber and having a second pressure face cooperating with the other end of said cylinder to form a second expansible chamber,

f. said piston means including first valve means for admitting fluid under pressure to said first chamber, said first valve means being entirely supported by said piston means and movable therewith,

g. said first valve means extending through said piston and forming a portion of said first and second pressure faces,

h. said piston means including second valve means for admitting fluid under pressure to said second chamber, said second valve means being entirely supported by said piston means and movable therewith,

i. said second valve means extending through said piston and forming a portion of said first and second pressure faces,

j. said first valve means including means for venting said first chamber when fluid under pressure is admitted to said second chamber and said second valve means including means for venting said second chamber when fluid under pressure is admitted to said first chamber,

k. means for alternatively connecting a source of fluid under pressure to said first and second chambers through said first and second valve means, respectively,

l. said first valve means including means for trapping fluid in said first chamber when the pressure of the source of fluid under pressure is reduced while said first chamber is connected to the source of fluid under pressure,

m. said piston means, cylinder and drawing member being mounted for unitary rotation,

n. said first and second valve means being mounted in said piston means radially outward of the axis of rotation of said piston means, cylinder and drawing member for

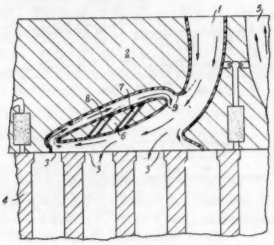
movement relative thereto in a direction parallel to said axis of rotation, and

o. each of said first and second valve means including a pressure responsive valve piston having a face thereof forming said pressure face portion.

3,924,515
PORTING ARRANGEMENTS OF AXIAL PISTON PUMPS AND MOTORS

Robert Cecil Clerk, Edison House, Fullerton Road, Glenrothes, Fife, Scotland

Filed June 15, 1973, Ser. No. 370,374
Int. Cl.² F01B *13/04*
U.S. Cl. 91—472 **7 Claims**



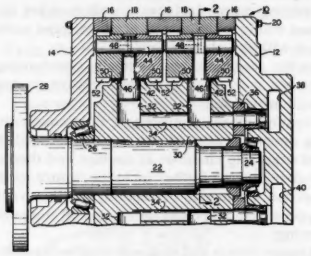
1. In an axial piston pump/motor including reciprocating pistons carried by a rotating cylinder block, a stationary port-face including inlet and outlet ports, each of said inlet and outlet ports having a leading edge and a trailing edge with respect to the direction of rotation of said rotating cylinder block, and a pair of port galleries communicating with said inlet ports and said outlet ports, respectively, whereby fluid entering said port gallery associated with said inlet port flows into said cylinder block as it passes said port-face during rotation, said galleries constructed in a manner such that fluid is directed from said leading edge of said inlet port towards said trailing edge of said inlet port, the improvement which comprises hydrofoil means mounted within said port galleries, so that during increased rotation of said cylinder block a portion of said fluid passing said trailing edge of said inlet port is recirculated around said hydrofoil means towards said leading edge of said inlet port, said hydrofoil means being mounted within said port galleries so that first and second recirculation paths are formed therein, said first recirculation paths being disposed between said hydrofoil means and said rotating cylinder block, and said second recirculation path being disposed between said hydrofoil means and the surface of said port galleries.

3,924,516
HYDRAULIC PUMP OR MOTOR

Roger John Nelson, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed July 6, 1972, Ser. No. 269,444
Int. Cl.² F01B *13/06*
U.S. Cl. 91—491 **10 Claims**

3. A radial piston hydraulic pump or motor comprising: a housing having an internal track means formed on an inner wall thereof; a shaft journaled in the housing coaxial with the track means and projecting from one end of the housing; a cylinder barrel mounted on and keyed to the shaft and having a plurality of generally radially extending and outwardly open cylinders with pistons reciprocally mounted therein and projecting from the open ends thereof; valving means in the housing operatively associated with the cylinder barrel to alternately interconnect each of the cylinders with first and second ports provided in the housing; and roller means journaled on the projecting end of each piston for rotation about an axis eccentric to its central axis; each of the roller means drivingly engaging the track means; whereby upon relative rotation between the shaft and housing, the roller means will move along the track means and cause the pistons to reciprocate or, upon supplying a fluid under pressure to one of the

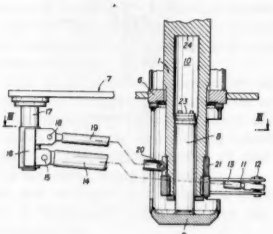


ports in the housing, the reciprocation of the pistons will cause rotation of the roller means which in turn causes relative rotation between the shaft and housing.

3,924,517
DEVICE FOR LIFTING AND PIVOTING A METALLURGICAL VESSEL

Jiri Stulik, Leonding, and Alois Scheinecker, Linz, both of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Mar. 19, 1974, Ser. No. 452,637
Claims priority, application Austria, Apr. 27, 1973, 3755/73
Int. Cl.² F01B *21/00*
U.S. Cl. 92—2 **2 Claims**



1. A device for lifting and pivoting a metallurgical vessel, in particular a tundish arranged above a mold in a continuous casting plant, said device comprising:

a hollow vertical column secured to the metallurgical vessel; means for lifting and lowering said vertical column;

a stationary member;

a first lever with one end rigidly secured to said vertical column;

a second lever with one end pivotally fixed to said stationary member;

a swivel drive for rotating said vertical column about its axis, said swivel drive comprising a cylinder and a piston actuated by a pressure medium, one end of said swivel drive being hingeably connected to the other end of said first lever and the other end of said swivel drive being hingeably connected to the other end of said second lever;

a follower rotatably secured about said vertical column; and

a guide rod with one end hingeably connected to said second lever and the other end pivotally secured to said follower.

3,924,518

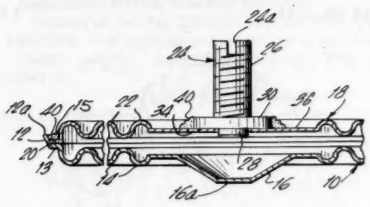
BAROMETER CAPSULE

Heinz Eberhard, Kinnelon, and Anton Menzer, Teaneck, both of N.J., assignors to Springfield Instrument Company, Inc., Hackensack, N.J.

Division of Ser. No. 266,622, June 27, 1972, Pat. No. 3,805,36b, which is a continuation-in-part of Ser. No. 58,343, July 27, 1970, abandoned. This application Feb. 11, 1974, Ser. No. 441,412

Int. Cl.[2] F01B *19/02*; F16J *3/04*

U.S. Cl. 92—34 7 Claims



1. A capsule for use in a pressure-responsive instrument comprising a first capsule member having a central motion-transmitting nipple integral therewith and a first marginal flange, a second capsule member having a central stud-receiving hole and a second marginal flange, a combined mounting and calibrating stud including a projection extending into said stud-receiving hole, means for attaching said stud to said second capsule member and for establishing a vacuum-tight interconnection therebetween, said first and second marginal flanges being constructed and arranged relative to each other to orient said stud substantially perpendicular to and axially aligned with said motion-transmitting nipple, said marginal flanges further being constructed and arranged to define an outwardly upwardly opening annular trough which is adapted to receive a sealant for providing a circumferential vacuum-tight connection between said first and second capsule members and a low viscosity adhesive sealant in said trough providing said vacuum-tight connection.

3,924,519

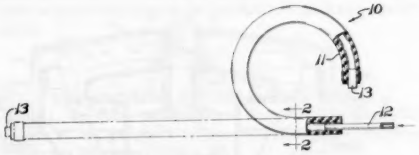
ACTUATOR

John S. England, Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Aug. 21, 1968, Ser. No. 754,225

Int. Cl. F01b *19/00*; F16j *3/00*

U.S. Cl. 92—92 11 Claims



1. An actuating device comprising: an elongated elastic tube having an opening extending longitudinally therein with one end closed and adapted to have fluid under pressure introduced therein, the said tube being formed of elastomeric material with at least one tension layer having a plurality of longitudinally extending substantially inextensible weftless reinforcing cords embedded therein and with the said layer extending transversely of the tube less than one-half of the transverse periphery thereof to provide a region having lesser longitudinal extensibility than the remainder of the periphery so that the tube is caused to assume an arcuate configuration about an axis at substantially right angles to its length upon introduction of a pressurized fluid into said opening.

3,924,520

PREPARING LITHOGRAPHIC PLATES UTILIZING VINYL MONOMERS CONTAINING HYDROLYZABLE SILANE GROUPS

Harold Boardman, Chadds Ford, Pa.; David S. Breslow, Wilmington, Del.; David A. Simpson, Wilmington, Del., and Richard L. Wagner, Wilmington, Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed June 27, 1974, Ser. No. 483,844

Int. Cl.[2] G03F *7/02*

U.S. Cl. 96—33 8 Claims

1. The process of making a photographic image which comprises providing the surface of a polymer film with a photooxygenation sensitizer, said film being a film of a polymer containing extralinear olefinic unsaturation of the type in which there is no more than one hydrogen atom on each of the double bond carbons and in which there is at least one allylic hydrogen on at least one of the carbons adjacent to the double bond carbons, which allylic hydrogen is not on a bridgehead carbon, exposing selected areas of the sensitized film to light having a wave length of from about 2000 to about 12,000 angstroms in the presence of oxygen, subjecting the exposed film to contact with a vinyl monomer containing a hydrolyzable silane group to effect graft polymerization of the vinyl silane monomer onto light-exposed areas of the polymer film, removing ungrafted vinyl silane monomer from unexposed areas of the polymer film, hydrolyzing the silane groups of the vinyl silane monomers grafted to the polymer film, and amplifying the hydrophilicity of the hydrolyzed silane groups by treating with at least one amplifying agent selected from soluble silicate solutions and colloidal silica dispersions.

3,924,521

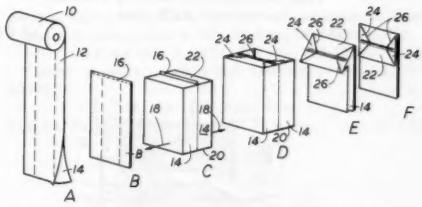
METHOD FOR FORMING FLAT BOTTOM PLASTIC BAGS

Violet M. Hanson, Old Bethpage, and John E. Finn, Plainview, both of N.Y., assignors to Violet M. Hanson, Old Bethpage, N.Y.

Filed May 22, 1974, Ser. No. 472,167

Int. Cl.[2] B31B *33/00*

U.S. Cl. 93—35 SB 10 Claims

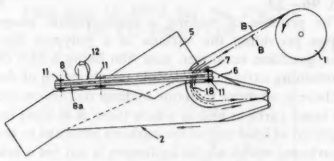


1. A method of making a reinforced flat bottomed bag comprising the steps of providing a sleeve having opposed faces and sides gusseted inwardly between the opposed faces, closing one end of said sleeve with a seam to seal the opposed faces together with the gusseted sides therebetween, thereafter pulling said opposed faces apart to open said sleeve, inserting a form within the other end of said sleeve and pressing the form against the closed end to flatten the whole of the gusseted sides against the faces forming flaps having folds lying in overlapping relationship with the opposed faces, and securing preselected portions of said flaps and said overlapping sides and faces to form a flat bottom.

3,924,522
COMMODITY PACKAGING

Keith Fraser Martin, Near Whalley, England, assignor to F. B. Mercer Limited, England

Filed Nov. 12, 1974, Ser. No. 523,074
Claims priority, application United Kingdom, June 3, 1974, 24425/74
Int. Cl.² B31B 33/02
U.S. Cl. 93—84 TW 6 Claims

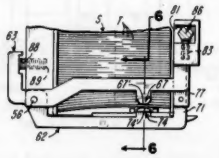


5. Apparatus for commodity packaging comprising an elongate mandrel including an upstream end, a downstream end, a hollow feed portion, a product opening in the surface of said hollow feed portion, a further aperture in the surface of said hollow feed portion, drive means for passing tubular flexible packaging material into the interior of said hollow feed portion through said further aperture, for passing the material through the mandrel interior towards said upstream end, for opening the material up at said upstream end and passing the material back axially along the outer surface of the mandrel towards the downstream end with the material enclosing the mandrel, slitting means for continuously axially slitting the material as it passes over the mandrel, guide means extending along the mandrel to take the severed edges of the material defining the slit in charge and guide the severed edges past the product opening and said further aperture and into sealing juxtaposition downstream of said opening, and sealing means downstream of said opening for sealing the juxtaposed edges so that the material reverts to a continuous tube with an axial seal.

3,924,523
PINNING MACHINE AND METHOD

Charles B. Bussard, Kettering; Paul H. Hamisch, Sr., Dayton, and David R. Wisecup, Xenia, all of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Dec. 19, 1974, Ser. No. 534,323
Int. Cl.² B27F 7/06
U.S. Cl. 93—87 15 Claims

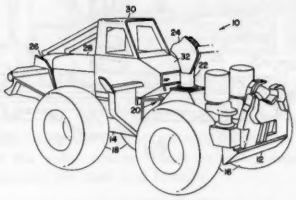


1. Method of pinning tags to merchandise, which method is practiced in a pinning machine having an anvil and a cooperable plunger, a hopper for receiving a stack of tags, means for feeding one tag at a time to a pinning zone between the anvil and the plunger, means for driving a pin through the tag and the merchandise at the pinning zone, comprising the steps of: sensing the position of the leading marginal end of the bottom tag in the stack, positioning a gate opening at the out feed end of the hopper in alignment with the leading end of the bottom tag in accordance with the tag position sensed by the sensing means, feeding the bottom tag through the gate opening to the pinning zone and driving a pin through the tag and merchandise between the die and the anvil to pin the tag to the merchandise.

3,924,524
CAB CONFIGURATION FOR STRATEGICALLY HOUSING AN ENVIRONMENTAL CONTROL UNIT ON AN ARTICULATED VEHICLE

Edwin Lee Whisler, Peosta, Iowa, assignor to Deere & Company, Moline, Ill.

Filed July 19, 1974, Ser. No. 490,139
Int. Cl.² B60H 3/00
U.S. Cl. 98—2.11 1 Claim

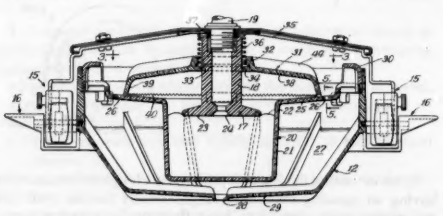


1. In an articulated vehicle of the type including first and second frame sections pivotally interconnected by a vertical hinge structure, a boom support structure mounted on the first frame for rotation about a vertical axis located adjacent the hinge structure and including an elevated portion offset laterally from the vertical axis and located to trace an arcuate path extending directly above said hinge structure, and a cab mounted on the second frame section adjacent the hinge structure, the improvement comprising: said cab including a lower housing portion extending directly above said hinge structure at a level below said arcuate path and having at least a portion thereof located directly below a portion of said elevated portion of the boom support when the portion of the elevated portion is located directly above said hinge structure and cab environment control elements being located in said lower housing portion.

3,924,525
BEVERAGE CHAMBER FILTER

Charles J. Vitous, Berwyn, Ill., assignor to Cory Food Services, Inc., Chicago, Ill.

Filed May 10, 1973, Ser. No. 359,187
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² A47J 31/00
U.S. Cl. 99—303 20 Claims



1. In a brewer for brewing a beverage from a charge of particulate brewing ingredients, means defining a brewing chamber for holding the brewing ingredient charge and having an outlet opening for delivering brewed beverage from the chamber, and means for introducing brewing liquid to said chamber for acting on a charge therein,

means for controlling flow of the brewed beverage outwardly through said outlet opening comprising an impermeable wall element extending across said outlet opening and having a peripheral edge portion engaging said brew-

ing chamber means about said outlet opening and defining therewith a plurality of small flow passages having a size preselected for passing the brewed beverage outwardly therethrough while effectively preventing passage of particulate charge material therethrough.

3,924,526

DEVICE FOR APPLYING STRAPPING MATERIAL TO ROUND PACKAGES OR THE LIKE

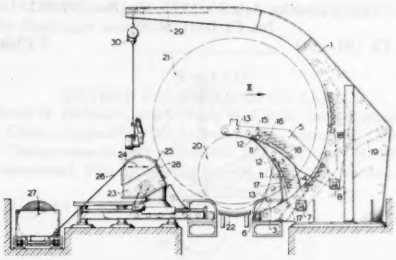
Gerd Bühne, Schwelm, Germany, assignor to Titan Verpackungssysteme GmbH, Schwelm, Germany

Division of Ser. No. 335,828, Feb. 26, 1973, Pat. No. 3,867,878. This application Apr. 30, 1974, Ser. No. 465,542

Claims priority, application Germany, Feb. 26, 1972, 2209120

Int. Cl.[2] B65B *13/04*

U.S. Cl. 100—25 **5 Claims**



1. A device for strapping round packages of various diameters, which includes: a stand, a plurality of segments respectively supported by and pivotally connected to said stand so that each two adjacent segments have portions thereof boxed into each other, fluid operable cylinder piston means interposed between and operatively connected to said stand and one of said segments for pivoting said segments relative to each other, guiding means including strip means and guiding roller means journalled on said segments so that the first roller means on one segment cooperate with the strip means on the respective adjacent segment so as to guide the same into a position partially closely embracing the package to be strapped, stationarily journalled first magnetic roller means respectively arranged on said segments, and second magnetic roller means displaceably mounted on at least some of said segments and variable as to their positions by said segments during a pivot movement of said segments relative to each other, said first and second magnetic roller means being operable to guide the strap to be applied to a package around the same.

3,924,527

IMPRINTING DEVICE WITH INDEXER

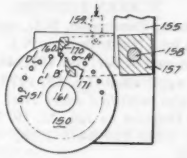
James L. Shenoha, Lockport, and Bud Sheth, Downers Grove, both of Ill., assignors to Norwood Marking & Equipment Co., Inc., Downers Grove, Ill.

Filed Dec. 7, 1973, Ser. No. 422,654

Int. Cl.[2] B41L *45/00;* **B41J** *4/34*

U.S. Cl. 101—88 **2 Claims**

1. A marking device for imprinting selected indicia on a surface to be imprinted comprising in combination: a marking device including a marking means and means for indexing said marking means, the marking means comprising a plurality of spaced apart face means for imprinting different indicia, the means for indexing comprising a rotatable member associated with the face means for moving the face means, one at a time, by rotation of the rotatable member, into position for imprinting, a plurality of projections associated with the rotatable member, a reciprocatable member having at least two spaced apart cam surfaces attached thereto, a first cam surface engaging one of said projections, engagement of said one projection moving the said one projection in one direction, said one projection being connected to said rotatable member, movement of the said one projection in the one direction imparting rotating movement to the rotatable member in a first direction, a second cam surface engaging either said one projection or an adjacent projection, engagement of the said one projection or an adjacent projection by the second cam surface moving the said one projection or an adjacent projection in the one direction, said projection engaged by said second cam surface connected to the rotatable member, movement of the projection engaged by the said second cam surface in the one direction imparting a rotating movement to the rotatable member in the first direction, engagement of the first cam surface with the said one projection being in dependent relation to movement of the reciprocating member in a first reciprocating direction, engagement of the second cam surface with the projection engaged thereby being in dependent relation to movement of the reciprocatable member in a second reciprocating direction, opposite the first reciprocating direction, only one of said cam surfaces engaging a projection at a time, power means for moving the reciprocatable member in the first and second reciprocating directions, the reciprocatable member being a pivotable member having a pivot point spaced radially of the rotatable member with a face portion positioned axially of the rotatable member spaced from an axial end face of the rotatable member, the cam surfaces being side walls of cam members projecting from the pivotable member, the cam surfaces extending axially of the rotatable member and the projections extending axially of the rotatable member from an axial end face thereof.



3,924,528

PRINTER

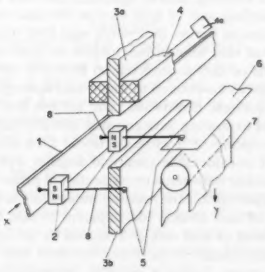
Ludwig Ludin, Anglikon, Switzerland, assignor to Camille Bauer Messinstrumente AG, Wohlen, Switzerland

Filed Oct. 3, 1973, Ser. No. 403,329

Claims priority, application Germany, Oct. 6, 1972, 2249125

Int. Cl.[2] B41J *9/04*

U.S. Cl. 101—93.15 **12 Claims**



1. A printer comprising a plurality of deflectable printing components and a recording means, each of said components

being attached to a movable transport means adapted to sequentially carry said printing components in a path extending along a line with respect to said recording means, a permanent magnet attached to each of said components to move conjointly therewith and an electromagnet fixed in spaced relationship to the line of movement of said permanent magnets, said permanent magnets being adjacent said recording means, said permanent magnets having their polarity varying alternately from component to component, and means for selectively exciting said electromagnet with a given polarity to produce a force field on at least one permanent magnet to thereby cause deflection of selected printing components in the direction of said recording means to cause said print component to print thereon.

3,924,529
TORSION BAR FLOATING SQUEEGEE MOUNT FOR SCREEN PRINTER

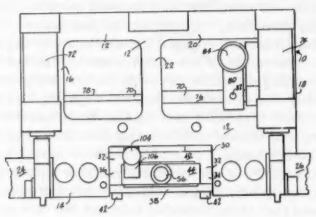
Russell W. Atkinson, Flemington, N.J., assignor to Affiliated Manufacturers Inc., North Branch, N.J.

Continuation-in-part of Ser. No. 188,946, Oct. 13, 1971, abandoned. This application Oct. 15, 1973, Ser. No. 406,357

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² B41F *15/42*

U.S. Cl. 101—123 **9 Claims**



1. A squeegee head for horizontal movement over a horizontal printing screen covering a substrate to move a squeegee, in engagement with said screen over said screen to perform a screen printing operation comprising:

a frame;

a squeegee support connected with said frame and vertically slidable with respect to said frame;

a squeegee below, and connected with, said squeegee support;

an elongated torsion bar connected with said frame;

a link fixedly secured at one end to said torsion bar and connected at its other end with said squeegee support;

first rotating means to rotate said torsion bar;

said first rotating means spaced from said link along the longitudinal axis of said torsion bar and connected with said torsion bar so that when said first rotating means is actuated said torsion bar rotates to pivot said link about the axis of said torsion bar so that said other end of said link moves downward to move said squeegee support and said squeegee downward, said torsion bar at the portion thereof extending between said link and said first rotating means being of a cross-sectional area small enough to permit considerable torsional angular deflection in said torsion bar between a cross-sectional plane of said torsion bar adjacent to said rotating means and a cross sectional plane of said torsion bar adjacent to said link when said other end of said link is acted on by an upward force of a value typical of the force between said squeegee and said screen during a printing operation whereby, said squeegee and squeegee support can resiliently, and with substantially uniform pressure follow any irregulaities in said substrate, and;

torque regulating means connected with one of said link and said means to rotate said torsion bar to change the angularity of a cross sectional plane of said torsion bar adjacent to said regulating means;

whereby said first rotating means can rotate said torsion bar to lower said squeegee to a height where it will engage said printing screen during said printing operation and said torque regulating means can be actuated to control the torsional angular deflection in said torsion bar between said first means to rotate said torsion bar and said link and thereby control said substantially uniform pressure when said squeegee is at said height.

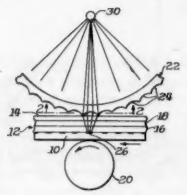
3,924,530
RESOLUTION THERMAL SPIRIT MASTERS APPARATUS

Joseph Gaynor, Arcadia, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Continuation of Ser. No. 130,722, April 2, 1971, abandoned. This application July 23, 1973, Ser. No. 381,842

Int. Cl. B41I *19/00*

U.S. Cl. 101—141 **5 Claims**



1. Apparatus for thermally transferring a copy of an original image comprising:

a source of radiant energy;

a cylindrical drum transparent to said radiant energy surrounding said radiation source and having a plurality of lenticular lenses perimetrically disposed thereon; and

means spaced from said drum for applying pressure to an assemblage of an original sheet, a thermal transfer sheet, and an image receiving sheet disposed between said drum and said means;

said lenticular lenses having a focal length such that when they directly overlie said pressure applying means and contact said assemblage said energy is focused between said lens and pressure applying means and at the original image on said original sheet.

3,924,531
SPRAY DAMPENER FOR ROTARY PRESS

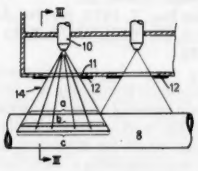
Friedrich Klingler, Kissing, Germany, assignor to Maschinenfabrik Augsburg-Nurnberg A.G., Augsburg, Germany

Filed Nov. 29, 1973, Ser. No. 420,249

Claims priority, application Germany, Nov. 29, 1972, 2258321

Int. Cl.² B41L *25/06*

U.S. Cl. 101—147 **15 Claims**



1. In a rotary printing press, a foutain system for uniformly applying wetting liquid to the printing plates comprising

means directing wetting liquid on a roller of the printing press, including

a housing (9);

a plurality of spray means (10) to spray wetting liquid, located in the housing, each spray means providing a divergent stream of wetting liquid in sheet form directed towards the roller to be wetted and impinging thereon along an impingement line, the housing being formed with openings (16) through which the sheet of spray from the spray means may pass,

said spray means being secured in the press in axially fixed position with respect to the roller axis and movable in a plane transverse with respect to said axis to change the impingement line of the spray on the roller and hence the axial coverage of the sheet of spray on the roller from any one spray means.

8. Press according to claim 7, further comprising adjustment slider means (120) secured to the diaphragm slider (121) to fine-adjust the spray pattern from the spray means (114, 126) passing through the diaphragm openings (122) in the diaphragm slider (121).

3,924,532

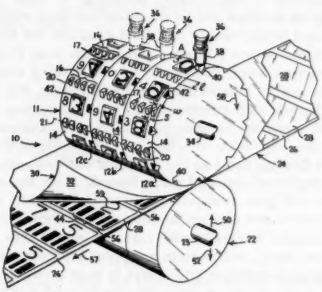
METHOD FOR PRINTING ON LABELS

David W. Hubbard, and William W. Coville, both of Stamford, Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 373,381, June 25, 1973, abandoned. This application Apr. 26, 1974, Ser. No. 464,500

Int. Cl.² B41L 47/46

U.S. Cl. 101—426 2 Claims



1. A method of preparing a label or the like that is to be marked with a machine readable bar code character; comprising the steps of

placing the label and an overlying ink ribbon between a pressure element and a printing drum having a plurality of groups of bar code scribing elements and a plurality of groups of alpha-numeric character types peripherially spaced relative to said scribing elements disposed thereon;

locating a selected group of said bar code scribing elements in scribe printing positions;

moving the said selected group of scribing elements and said pressure element toward one another and into opposed printing pressure relation with respect to said ink ribbon and label;

moving said ink ribbon and label between the said selected scribing elements and the pressure element while maintaining said printing drum stationary so as to thereby scribe machine readable code bars on said label;

continuing said movement of said ink ribbon and label for a distance corresponding to the length desired for the code bars of said code character; and

rotating said printing drum in coordination with the movement of said ink ribbon and said label to print alpha-numeric characters on said label adjacent said scribed bar codes.

3,924,533

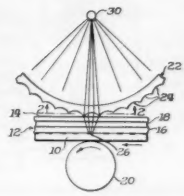
RESOLUTION THERMAL SPIRIT MASTERS METHOD

Joseph Gaynor, Arcadia, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Division of Ser. No. 130,722, April 2, 1971, abandoned. This application July 23, 1973, Ser. No. 381,841

Int. Cl. B41m 5/18, 5/26; B41c 1/10

U.S. Cl. 101—467 1 Claim



1. A method for thermally transferring an original image comprising the steps of:

forming an assemblage of an original image, a thermal transfer sheet and an image receiving sheet;

simultaneously applying pressure to said assemblage using a drum transparent to radiant energy surrounding a radiation source and having a plurality of lenticular lenses perimetrically disposed thereon, and irradiating said original image with a plurality of concentrated spaced bundles of thermal energy focused thereon from said source using said lenses, thereby lessening lateral heat transfer and providing variable optimum exposure time;

ceasing said pressure application and said irradiation; and

separating said image receiving sheet from said assemblage.

3,924,534

LIGHTWEIGHT CARTRIDGE CASE OF IMPROVED ALUMINUM ALLOY MATERIAL WHICH ELIMINATES CATASTROPHIC FAILURES

Frederick R. Gruner, Bel Air, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 8, 1974, Ser. No. 522,075

Int. Cl.² F42B 5/28

U.S. Cl. 102—43 R 3 Claims

1. A lightweight cartridge case of a high strength aluminum alloy, said alloy including Al_2O_3 dispersoid in an aluminum alloy matrix uniformly distributed throughout said alloy matrix resulting in a substantially continuous network of Al_2O_3 throughout said alloy.

3,924,535

PULSE GENERATING CIRCUIT

Dewey A. Roos, Corona; Kenneth A. Lawlor, and Erwin I. Abadie, both of Riverside, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 19, 1965, Ser. No. 473,913

Int. Cl.² F42C 15/40

U.S. Cl. 102—70.2 R 6 Claims

1. In a pulse generating system, the combination of:

an amplifier adapted to receive a series of negative pulses followed by a series of positive pulses, said amplifier being adapted to amplify equally pulses of both polarities;

a pair of monostable multivibrators;

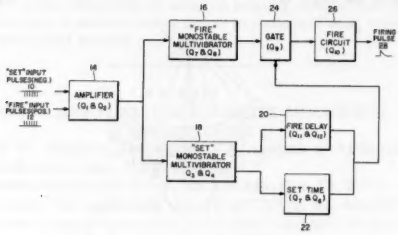
a circuit for applying the output of said amplifier to one of said multivibrators, so that said one multivibrator receives only pulses of positive polarity;

means for applying the output of said amplifier to the other of said multivibrators so that such other multivibrator receives only pulses of negative polarity and develops pulses of both polarities in response thereto;

a pair of timing circuits;

means for applying the positive pulse output of said other multivibrator to one of said timing circuits;

means for applying the negative pulse output of said other multivibrator to the remaining one of said circuits;



a gating network;

means for combining the respective outputs of said timing circuits and applying such combined outputs to said gating network;

means for applying the output of said one multivibrator to said gating network;

and a utilization circuit receiving the output of said gating network and energized only when said gating network is open.

3,924,536

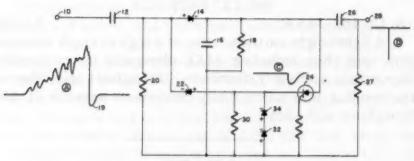
FUZE SIGNAL CIRCUIT

John O. Dick, Riverside, and Howard M Forrester, Corona, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 15, 1965, Ser. No. 507,962

Int. Cl.[2] F42C *13/02*

U.S. Cl. 102—70.2 P **8 Claims**



1. In a fuze signal processing circuit of an infrared guided missile fuzing system, the combination comprising:

a. capacitor storage circuit means adapted to be charged by only the positive going portions of a reflected target signal having a modulated sawtooth waveform with a negative overshoot at its trailing edge,

b. switch circuit means coupled across said capacitor storage circuit means and being responsive to the negative overshoot portion of the noise modulated signal to close said switch circuit means and thereby discharge said capacitor storage circuit means to produce an output pulse.

3,924,537

ELECTROMAGNETIC RAILS FOR DRIVING TRAINS BY THYRISTOR-CONTROLLED LINEAR MOTORS

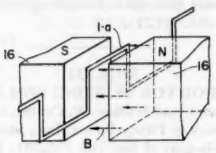
Kazumi Matsui, Tokyo; Takashi Umemori, Musashino; Kenji Matsuura; Yoshikado Hosoda, both of Osaka; Tadashige Nishikawa, Tokyo, and Makoto Tawara, Hiratsuka, all of Japan, assignors to Japanese National Railways, Tokyo; Sumitomo Electric Industries, Ltd., Osaka and Furukawa Electric Co., Ltd., Tokyo, all of, Japan

Filed July 26, 1973, Ser. No. 383,017

Claims priority, application Japan, July 27, 1972, 47-75391; Aug. 25, 1972, 47-85183; Sept. 2, 1972, 47-88113; Sept. 2, 1972, 47-88115; Sept. 2, 1975, 47-88117; Sept. 2, 1972, 47-88118; Sept. 2, 1972, 47-88119; Aug. 25, 1972, 47-99209; Aug. 25, 1972, 47-99211; Sept. 22, 1972, 47-110337; Sept. 22, 1972, 47-95336

Int. Cl.[2] B61B *13/08*

U.S. Cl. 104—148 LM **13 Claims**



1. In an electromagnetic rail for driving a train by a thyristor-controlled linear motor including a field structure mounted on the train and an armature coil fixed relative to the ground and juxtaposed to said field structure for imparting a driving force and/or a floating force to the train through said field structure when an electric current flowing through said armature coil is commutated by the thyristor, the improvement wherein: said electromagnetic rail comprises an armature coil assembly consisting on N pairs of undulating coil arrays, the coil sides of which contributes a driving force and/or a floating force to the train and one coil array of each pair is displaced one coil pitch interval from the other coil array of said pair, said pairs are displaced at 1/N coil pitch intervals from one another, an insulator covers said coil arrays and is molded integrally with said coil arrays into a unitary plate-form body, and wherein a support supports said molded and insulated armature coil arrays in such a manner that the current loops of the currents flowing in said coil arrays are vertical to the ground.

3,924,538

ELECTROMAGNETIC-SUSPENSION VEHICLE SYSTEM

Ulrich Breitling, Munich, and Klaus Simon, Eichenau, both of Germany, assignors to Krauss-Maffei Aktiengesellschaft, Munich, Germany

Filed Mar. 4, 1974, Ser. No. 447,560

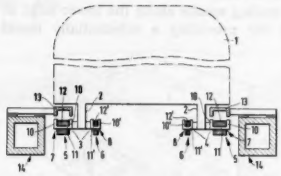
Claims priority, application Germany, Apr. 17, 1973, 2319387

Int. Cl.[2] B61B *13/08*

U.S. Cl. 104—148 MS **3 Claims**

1. In a system for the electromagnetic suspension of a vehicle upon a track wherein the vehicle is provided with a pair of electromagnet arrangements on opposite sides thereof and each of the electromagnet arrangements comprises a pair of subrows of electromagnets, the track being formed with armature rails respectively cooperating with the electromagnets of said subrows and having junctions in which there is a transition of the magnetic suspension function between armature rails cooperating with subrows on a side of the vehicle, the improvement wherein one subrow of each pair of subrows forms main suspension electromagnets which may cooperate with a corresponding main armature rail, wherein the other subrow of said pair of subrows forms auxiliary suspension

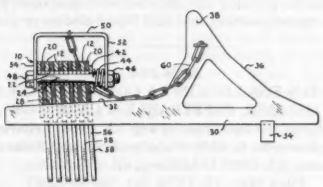
electromagnets which may cooperate with a corresponding auxiliary armature rail, the main armature rails and electromagnet cores of the main suspension electromagnets being provided with a substantially common pole spacing which is different from the common pole spacing of the auxiliary armature rails and the electromagnet cores of the auxiliary suspension electromagnets, such that any magnetic effects between main suspension electromagnets and auxiliary armature rails and between auxiliary suspension electromagnets and main armature rails, respectively are of insubstantial magnitude, the main armature rails and electromagnets having a greater pole spacing than the auxiliary armature rails and electromagnets.



3,924,539
RAIL WHEEL STOP

S. Anton Wladis, 1120 N. Lake Shore Drive, Chicago, Ill. 60611

Filed Dec. 16, 1974, Ser. No. 532,893
Int. Cl.² B61K 7/04
U.S. Cl. 104—258 **4 Claims**



2. A rail wheel stop for attachment to the head of a rail, comprising:

a multiplicity of thin plate members, each thereof having a recess for fitting over one side of said rail head, and a second multiplicity of thin plate members, each thereof having a recess for fitting over the other side of said rail head, said recesses and faces of said plate members defining a corner at the edges thereof;

said multiplicity of said plate member and said second multiplicity of said plate members being alternately mated for interface contact to obtain a lamina body of said plate member;

means acting on said plate members to tighten said plate members against said rail head to render said stop body immovable thereon;

each of said plate members having a hole which are collectively aligned to form a centrally disposed hole passageway;

a pin means through said hole passageway to pivotably connect said first and said second multiplicity of plate members;

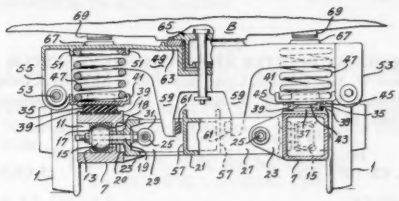
a spring member on said pin means for urging said plate members together at their interfaces to obtain a lamina body of plate members; and

said pin means and said hole passageway having a sufficient clearance therebetween to allow said lamina body of said plate members to tilt on said rail head against the bias of said spring to elevate said corners to bear against said rail head when said means act in said plate member to tighten said plate members against said rail head.

3,924,540
RAILWAY VEHICLE TRUCK

Thaddeus W. Podgajny, Granite City, Ill., assignor to General Steel Industries, Inc., St. Louis, Mo.

Filed Apr. 25, 1974, Ser. No. 464,114
Int. Cl.² B61F 3/00
U.S. Cl. 105—197 R **15 Claims**

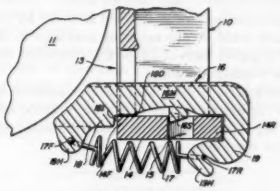


1. A railway vehicle truck comprising a pair of spaced axles, a gauged pair of wheels mounted on the ends of each said axle, longitudinally extending transversely spaced side frames supported at their ends on opposite end portions of said axles, a transverse transom extending the full distance between said side frames, means preventing relative vertical and lateral movement and relative angular movement in the horizontal plane between said transom and both said side frames, said preventing means including a pivotal connection between one of said side frames and said transom intermediate said axles and in substantial longitudinal alignment with the supports of said one side frame on said axles, permitting pivotal movement of said one side frame about a transverse axis with respect to said transom, and longitudinally extending link means spaced inwardly transversely of the truck from said pivotal connection and being pivotally connected at its one end to said one side frame and at its other end to said transom.

3,924,541
SIDE FRAME KEY ASSEMBLY

Robert W. MacDonnell, Crete, and Otto A. Shander, Chicago Heights, both of Ill., assignors to R. W. Mac Company, Crete, Ill.

Continuation-in-part of Ser. No. 501,067, Aug. 27, 1974, abandoned. This application May 15, 1975, Ser. No. 577,736
Int. Cl.² B61F 5/26
U.S. Cl. 105—221 K **15 Claims**



1. A side frame key assembly for preventing accidental escape of a roller bearing unit mounted for relative vertical movement in a pedestal-type side frame that includes a vertical side wall having a horizontal base portion projecting away from the roller bearing unit, said vertical side wall having a generally rectangular key opening facing a lower peripheral region of the roller bearing unit, the key opening bordered by a front base corner portion and a top corner portion of the side wall, said key assembly comprising angular keying structure overlying the horizontal base portion and freely movable in the key opening and having direct keying means to fulcrum against said front base corner portion and remote keying

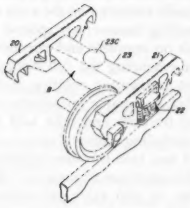
means for abutment against a spaced apart side frame portion, said key structure having a rearwardly projecting lever portion overlying said base portion and an outwardly projecting retainer portion bordering the lower peripheral region of the roller bearing unit, and locking loop means underlying the horizontal base portion and releasably engaging between spaced attachment portions of the key structure to complete a tie loop embracing the horizontal base portion to retain the key structure in movable relation to enable both said keying means to react directly against the side frame when the roller bearing unit applies load force to the retainer portion.

3,924,542

RAILWAY BOLSTER RE-ENFORCEMENT SYSTEM

Robert W. Mac Donnell, Crete, and Otto A. Shander, Chicago Heights, both of Ill., assignors to R. W. Mac Company, Crete, Ill.

Filed May 22, 1974, Ser. No. 472,428
Int. Cl.² B61F *1/12*, *5/04*, *5/50*; F16B *43/02*
U.S. Cl. 105—226 **25 Claims**



1. In a railway truck bolster structure that includes a hollow bolster body having an upper wall structure incorporating a top center plate section, a lower wall structure having a bottom central section flanked by upwardly and outwardly inclined intermediate bottom wall sections and horizontal spring seal wall sections merging with and extending outwardly from said inclined intermediate sections, and internal ribbing connecting said upper wall structure and said lower wall structure, an improved bolster re-enforcement comprising elongated means extending across said bottom central section, lug means engaging intermediate portions of said inclined intermediate bottom wall sections in flanking relation to said bottom central section and means for securing said tension means to said lug means under predetermined rension to precompress the bottom center section of the bottom wall.

15. In a bolster structure as defined in claim **12** wherein said lug means have weld means securing said lugs to the inclined bottom wall sections outwardly of the outboard bolster edge region of the window opening.

20. A prestressible bolster structure as defined in claim **19** wherein said lug means merge with said inclined intermediate bottom wall sections adjacent the inboard bolster edge regions of the window openings.

3,924,543

COKE QUENCH CAR

Anthony F. Mantione, Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Oct. 18, 1974, Ser. No. 516,043
Int. Cl.² B61D *3/00*
U.S. Cl. 105—257 **3 Claims**

1. In a coke quench car equipped with:

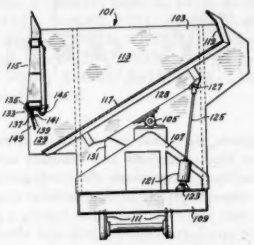
a. a support frame,

b. a coke basket on said frame defined by:

1. a pair of spaced end walls connected to said frame;
2. a front panel extending between said end walls connected to said end walls, spaced above said frame;
3. a floor between said end walls, disposed above said frame, pivotably mounted on said frame; and
4. a back wall extending between said end wall connected to the back edge of said floor;

c. whereby coke is retained in said basket when said floor is pivoted to a closed position and coke is discharged when said floor is pivoted to an open position, the improvement comprising:

1. first sealing means along the lower edge of said front panel for providing a substantially liquid-tight seal



between said floor and said front panel when said floor is in the closed position, to retain coke plus liquid in said basket;

2. a second sealing means along the lower edge of said front panel for discharging liquid and retaining coke in said basket when said floor is pivoted to a liquid-discharge position intermediate the open and closed positions; and

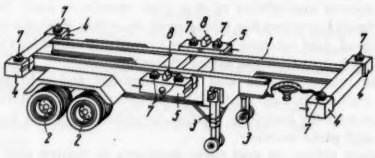
d. means for pivoting said floor between said open position, said closed position, and said liquid-discharge position.

3,924,544

APPARATUS FOR LOCKING A CONTAINER ON A BASE MEMBER, PREFERABLY A CARRIAGE

Dietrich Grau, Grauenbrunnenweg 23, 6906 Leimen; Franz Beigel, Rosenstr. 6, 6906 Malschenberg, and Roland Blanz, Werderstr. 12, 6900 Heidelberg, all of Germany

Filed Mar. 13, 1974, Ser. No. 449,587
Claims priority, application Germany, Mar. 13, 1973, 2312402; Aug. 28, 1973, 2343251
Int. Cl.² B61D *17/00*
U.S. Cl. 105—366 B **16 Claims**

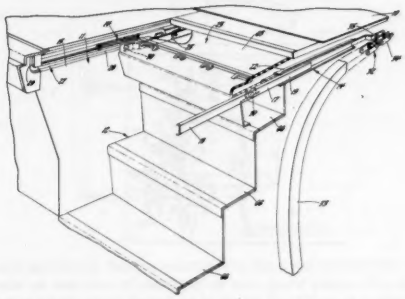


1. Apparatus for locking a container on a base member, said apparatus including one or more spring-loaded tension rods mounted at the base member to engage by force and form one or more fittings provided at the container, where each tension rod has a locking head and can be moved from a locking position into a release position by means of a guide, wherein the improvement comprises a drive means for lifting and pivoting each tension rod into the release position, said drive means comprising a fluid pressurized plunger guided in a working cylinder, the working cylinder being adapted for communication with a source of fluid pressure via a control device, and further comprises a compression spring for the automatic self-locking and continuous retensioning of each tension rod.

3,924,545
RAILWAY CAR DUAL ACCESS LEVEL SELECTION APPARATUS

Robert Anders, Westmont, and Daniel H. Kussow, Lisle, both of Ill., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 11, 1975, Ser. No. 549,001
Int. Cl.² B61D *23/00*
U.S. Cl. 105—450 **3 Claims**



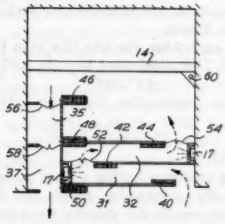
1. In a railway car having a floor, a sidewall, a doorway through the sidewall, and a stairwell having steps descending from the floor to the doorway at a lower level, access level selection apparatus comprising, in combination:

a platform having a cam follower projecting therefrom; a pair of horizontal parallel platform tracks in the stairwell; a longitudinally movable bar in each platform track; a plurality of parallel links connecting the bars to opposite sides of the platform to support the platform parallel to the floor and move the platform with the bars horizontally between the stairwell and a lower level access position under the floor; the links further being pivotably connected to the bars and the platform, whereby the platform is vertically movable in the stairwell to a floor level access position covering the stairwell and continuous with the floor; and a camtrack in the stairwell engaging the platform cam follower to guide the platform between its floor and lower level access positions with longitudinal movement of the bars.

3,924,546
ANTI ROBBERY PROTECTION EQUIPMENT

Gisberto Pretini, Via della Stazione 3, S. Frediano A Settimo, Pisa, Italy (I-56026)

Filed Sept. 20, 1973, Ser. No. 399,083
Claims priority, application Italy, Sept. 30, 1972, 9697/72
Int. Cl.² E05G *3/00*
U.S. Cl. 109—3 **6 Claims**

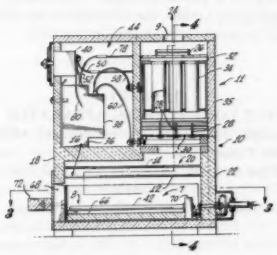


1. In a bank having an area accessible to the public, anti robbery protection equipment comprising, in combination, first partition means defining a first path providing only access to said public area; second partition means defining a second path providing only egress from said public area; said first and second partition means being at least partially transparent to allow the passage of persons along said path to be observed through said partition means; and closure means located at least at opposite ends of each path to define an area in each path which can be closed at both ends; the closure means in said access path being openable automatically responsive to approach of a person in the access direction and blocking movement in the egress direction, and the closure means in said egress path being openable automatically responsive to approach of a person in the egress direction and blocking movement in the access direction.

3,924,547
ELECTRIC INCINERATOR WITH ELECTROSTATIC FILTER

Arthur W. Werner, Cathedral City, Calif., assignor to Earle M. Macartney and Marjorie Macartney, both of Palm Desert, Calif.

Filed Aug. 19, 1974, Ser. No. 498,449
Int. Cl.² F23G *5/10*; **B03C** *3/00*
U.S. Cl. 110—8 E **12 Claims**



1. An electric incinerator comprising:

a thermally insulated housing having a vent to allow for expulsion of air from said incinerator;

a combustion chamber within said housing, for receiving refuse material to be burned within said incinerator;

heating means within said combustion chamber for igniting the refuse;

electrostatic filter means having at least a first set of elements and a second set of elements for filtering relatively small particles of debris in gaseous products from refuse burned in said incinerator;

power supply means for applying current to said heating means and applying relatively high voltage to said electrostatic filter; and

means for removably securing at least one of said first and second sets of elements of said electrostatic filter means in said housing, whereby said first and second sets of elements may be easily and quickly removed from said housing for periodic cleaning of debris build-up.

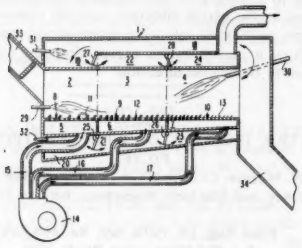
3,924,548
INCINERATOR

Michel G. J. Du Chambon, Versailles, France, assignor to B. V. Peximac, The Hague, Netherlands

Filed Nov. 21, 1973, Ser. No. 418,025
Claims priority, application France, Nov. 24, 1972, 72.41800
Int. Cl.² F23G *5/12*
U.S. Cl. 110—8 C **8 Claims**

1. An incinerator for household refuse, industrial waste, and like material, comprising a combustion chamber having a stationary grate means, means for supplying combustion air through said grate means, and filling and discharge means, characterized in that said grate means includes deflecting

members for directing said combustion air in a manner to lift said material being treated in the incinerator whereby said material is torn apart and brought into a fluidized state, and



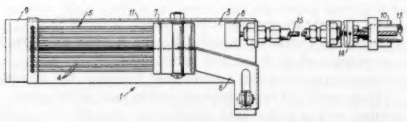
whereby owing to a pre-determined orientation of the air effected by said grate means, the combustion air also serves to transport said material through said incinerator.

3,924,549

BELT LOOP FEEDING APPARATUS

Donald Cummins, Hopewell, Va., assignor to AMF Incorporated, White Plains, N.Y.

Filed Oct. 24, 1974, Ser. No. 517,714
Int. Cl.[2] D05B *3/12*
U.S. Cl. 112—104 **8 Claims**



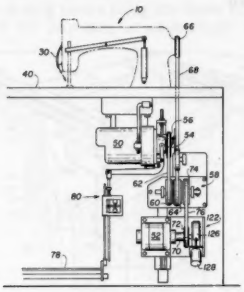
1. A semi-automatic apparatus for receiving and guiding belt loops being fed thereto for ultimate positioning and placement at a sewing station forward of said apparatus including: a principal body member having a flat bed feed surface on which one face of the loop is disposed; a side edge member attached to said body member for positioning one longitudinal edge of said belt loop; a canted cantilever spring attached to the top portion of said principal body member being adapted to act on an opposite longitudinal edge of said belt loop; a rake assembly in the form of a plurality of spaced apart fingers substantially parallel with said side edge adapted to constrain the movement and disposition of said loop by forcing it to lie flat on the feed surface of said apparatus; said cantilever spring being mounted on an adjustable shoe member allowing such member to move laterally of said feed surface for adjustment in accordance with a given width of belt loop; a pneumatic piston means having an elongated member with a plunger means at its working end enabling the loops to be fed along a pre-selected path in-line with said apparatus by the action of the working end of said piston member; said working member being adapted to index an outboard end of said loop beneath said plurality of spaced fingers to a predefined position at the sewing station forward of said apparatus; and deflector means disposed at the outlet end of said apparatus adapted to direct the dispensed loop in the same directional sense for each stroke of said pneumatic piston means.

3,924,550

STOP CONTROL MOTOR FOR A SEWING MACHINE

Ronald Boser, and Gerald Gluckin, both of 22 W. 26th St., New York, N.Y. 10010

Filed Aug. 15, 1974, Ser. No. 497,746
Int. Cl.[2] D05B *37/04, 69/14*
U.S. Cl. 112—130 **6 Claims**



1. In combination, a sewing machine having a sewing needle and motor means for driving said sewing needle through vertically reciprocating sewing strokes, said motor means having stopping characteristics related to its operating speeds, and a stop control for said sewing machine comprising a first motor control means for operating said sewing needle drive motor means at varying speeds so as to contribute to effective use thereof during a normal sewing interval of operation, a second motor control means operatively effective to operate said sewing needle drive motor means at a known selected speed having a correspondingly known stopping characteristic, a first sensing means operatively effective preparatory to termination of the sewing operation of said sewing machine to automatically cause the operation thereof by said second motor control means in preference to said first motor control means so as to have said sewing needle drive motor means operating at said known selected speed of operation, and a second sensing means operatively effective to terminate the sewing interval of said sewing machine while it is operating at said known selected speed, whereby said termination of operation occurs in accordance with said known stopping characteristic to contribute to termination in feed movement of the fabric being sewn at a selected location defining a work station.

3,924,551

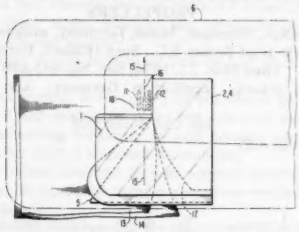
AUTOMATIC GUIDE DEVICE FOR SEWING MACHINE OR MACHINE FOR ASSEMBLING TWO OR MORE SUPERPOSED ELEMENTS

Wolfgang Heiler, Soufflenheim, Bas-Rhin; Rudolf Muller, Sessenheim, Bas-Rhin, and Jean-Jacques Becker, Bischheim, Bas-Rhin, all of France

Continuation-in-part of Ser. No. 254,753, May 18, 1972, Pat. No. 3,814,039. This application Dec. 21, 1973, Ser. No. 427,265
Claims priority, application Germany, May 27, 1972, 2225942
Int. Cl.[2] D05B *35/10*
U.S. Cl. 112—153 **3 Claims**

1. In a sewing machine having a base plate and a head carrying a vertically reciprocable needle and fabric feeding teeth adjacent the needle for moving superposed layers of fabric beneath the needle to form in the superposed layers of fabric an edge seam comprising a line of stitching extending in a stitching direction; the improvement comprising a guiding device mounted on the sewing machine above the base plate, said guiding device comprising a plurality of superposed plates

with guide pieces between said plates, said guide pieces having edges that guidingly contact the edges of the superposed layers of fabric with a said guide plate separating adjacent layers of fabric, said edges of said guide pieces extending toward said needle at an acute angle to said line of stitching,



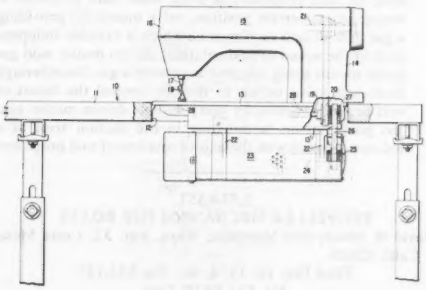
and said fabric feeding teeth being disposed only on the same side of said line of stitching as said guide pieces thereby to exert a torque on the fabric to swing the fabric in a direction to urge said edges of the fabric against said edges of said guide pieces.

3,924,552

MOTOR DRIVE FOR SEWING MACHINES

Lorenz A. Wendel, Somerville, N.J., assignor to The Singer Company, New York, N.Y.

Filed Feb. 24, 1975, Ser. No. 552,466
Int. Cl.[2] D05B *75/00*
U.S. Cl. 112—217.1 **5 Claims**



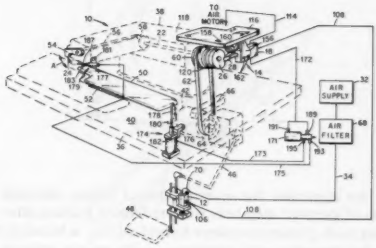
1. A sewing apparatus including a power table having a table top provided with a sewing machine receiving cut-out, a sewing machine mounted in said cut-out and having a bed and a rotary main shaft, hinge means supporting said machine on said table top providing for tilting said sewing machine backwardly to expose mechanism within the bed of the sewing machine, at least one motor supporting bracket secured to said sewing machine beneath the table top and disposed to extend downwardly and rearwardly of the cut-out, a motor fixed downwardly of the cut-out, a motor fixed in unitary relation relatively to said sewing machine by said bracket, and belt means connecting said motor to said sewing machine main shaft, the dimensions and unitary relation of said motor to said sewing machine being such that the sewing machine may be tilted back on said hinges without removing the belt means from the sewing machine or the motor and without causing interference between the motor and the table top in the movement of the machine from its operative position to its tilted back inoperative position.

3,924,553

NEEDLE POSITIONING APPARATUS FOR STITCHING MACHINES

William A. Tice, 6675 Maynardville Highway, Knoxville, Tenn. 37918

Filed Sept. 9, 1974, Ser. No. 504,324
Int. Cl.[2] D05B *69/22, 65/02*
U.S. Cl. 112—219 B **13 Claims**



1. In a stitching machine including a needle adapted for reciprocatory movement into and out of a workpiece, shaft means connected to said needle for reciprocating said needle upon rotation of said shaft, drive means including a drive motor for rotating said shaft, operator control means for activating and deactivating said drive means, the improvement for positioning said needle in a preselected position along its reciprocatory path comprising

a pneumatically powered positioning motor,

means connecting said positioning motor in driving relation to said shaft means for rotation of said shaft means when said drive motor is inactive,

a source of pneumatic pressure,

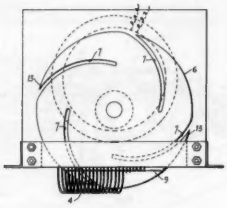
conduit means connecting said source of pneumatic pressure to said positioning motor,

valve means interposed in said conduit means and actuatably responsive to functioning of said operator control means,

control means interposed in said conduit means between said valve means and said positioning motor and operative when said valve means is open to activate said positioning motor to rotate said drive shaft to position said needle in a preselected position along its reciprocatory path,

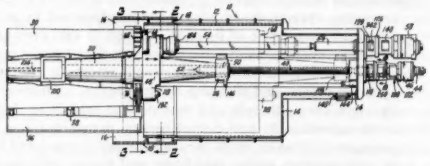
said control means comprising cylinder means having a bore extending therethrough, piston means disposed in said bore and having one of its ends exposed to said pressurized fluid when said valve means is open, the opposite end of said piston means being disposed externally of said cylinder means and defining detent means, cam means having a recess therein and mounted on said drive shaft in juxtaposition to said detent means, means defining a passageway in said piston means from its exposed end to an exit location within said bore, seal means defining a plurality of chambers between said piston means and said cylinder means, at least one of said chambers communicating with said exit location of said passageway in said piston means, and means defining an exit passageway from said bore to the exterior of said cylinder means at a location contiguous to said chambers, whereby the position of said piston means within said bore establishes fluid communication between at least one of said chambers and said exit passageway to control the flow of pressurized fluid to said positioning motor.

3,924,554
THREAD CHAIN CUTTING APPARATUS
Donald Cummins, Hopewell, Va., assignor to AMF Incorporated, White Plains, N.Y.
Filed Nov. 18, 1974, Ser. No. 520,756
Int. Cl.[2] D05B 65/04, 65/06
U.S. Cl. 112—252 9 Claims



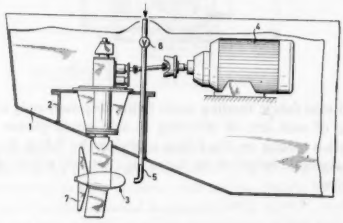
1. An apparatus for severing thread chains attached to a series of garment members is a predefined fashion after conveying such garment sections to said device; a housing structure for retaining said apparatus, guide means integral with said housing, for receiving said thread chain through passage ways associated therewith; a wheel disposed away from said guide means, driven by motor means affixed to said housing, said wheel including means to engage and move a defined section of thread chain away from the point of entry at said guide means; barrier means proximate to said rotating wheel and being spaced therefrom, serving to provide support for said thread chain during its movement away from said guide means by said rotating wheel; a pair of fixed knives each of which being disposed on either side of said rotating wheel for a blade to blade distance representing the amount of chain thread to be cut, said knives being adapted to sever said thread chain at a predefined time in response to the distance traveled by said chain and the force resulting therefrom as it travels under the action of said rotating wheel; and spring loaded sheaths covering the cutting surface of said knives serving to prevent such surfaces from prematurely cutting the thread chain until the downward force applied by the chain on said sheaths exceeds the opposing spring load force, at which time the cutting surface of said blades severs the thread chain.

3,924,555
STABILIZING FIN SYSTEM
Pellegrino E. Napolitano, Brooklyn, N.Y., assignor to Flume Stabilization Systems, Inc., Hoboken, N.J.
Filed Aug. 18, 1972, Ser. No. 281,953
Int. Cl.[2] B63B 39/06
U.S. Cl. 114—126 50 Claims



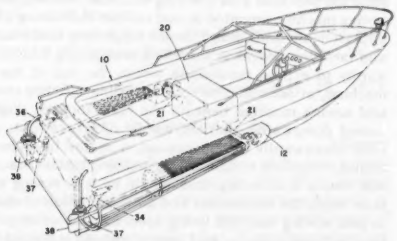
1. A device for damping the rolling motion of a ship comprising a fin chamber adapted to be located arthwartship in a ship's hull, a fin support axle having an opening therein slidably mounted in the fit chamber, a stabilizing fin rotatably mounted on the fin support axle and adapted to be located arthwartship in the operative position on one side of the ship's hull below the water line, a fin retraction shaft having a threaded section being rotatably mounted in the fin chamber and extending into the opening in the fin support axle, rotation means rotatably engaging the fin retraction shaft, nut means mounted in the opening of the fin support axle and operatively engaging the threaded section of the fin retraction shaft such that the stabilizing fin moves arthwartship when the fin retraction shaft is rotated and means cooperating with the stabilizing fin for rotating the stabilizing fin on the fin support axle.

3,924,556
DEVICE FOR REDUCING THE THRUST OF STEERABLE PROPELLERS
Gerd Wacker, Winnigen, Mosel, Germany, assignor to Schottel-Werft Josef Becker KG., Spay (Rhine), Germany
Filed Mar. 22, 1974, Ser. No. 453,690
Claims priority, application Germany, Apr. 9, 1973, 2317731
Int. Cl.[2] B63H 5/06
U.S. Cl. 115—35 3 Claims



2. A device for controlling the thrust of a steerable propeller pivotal about a vertical axis for the purpose of steering a watercraft, comprising:
a rotatably driven motor having a substantially constant output speed; and
means defining a gas guide which extends into a suction zone of said propeller, at least when said propeller is swung into a certain position, valve means for providing a gas flow to said suction zone which is variable independent of the speed of said rotatably driven motor, said gas guide means being adapted to convey a gas therethrough from said valve means to thereby control the thrust of said propeller driven by said rotatably driven motor, said gas guide means terminating in the suction zone at a location coaxial with the axis of rotation of said propeller.

3,924,557
PROPELLER MECHANISM FOR BOATS
David R. Bloch, 400 Merrimac Ways, Apt. 32, Costa Mesa, Calif. 92626
Filed Dec. 16, 1974, Ser. No. 533,139
Int. Cl.[2] B63H 5/08
U.S. Cl. 115—38 1 Claim



1. An improved propeller drive and rudder mechanism for boats comprising in combination;

a boat hull having an opening disposed on each side thereof positioned above the waterline;

an inboard motor means having a pair of drive shafts extending outwardly therefrom and received within each of said openings in said boat hull;

a watertight housing mounted over each of said openings;

a shaft drive means operably disposed within each of said housings and connected to respective motor drive shafts;

a pair of propeller shafts positioned along the outer sides of said hull wherein one end thereof is connected to said shaft drive means whereby said motor means operates said propeller shafts;

a propeller means located at one end of each propeller shaft;

a support member secured to said hull above the waterline thereof and positioned along the rear and sides of said hull extending forwardly to said housing whereby said propeller shaft is disposed thereunder;

bearing means attached to said support member and arranged to operably receive respective propeller shafts therethrough;

rudder means positioned to the rear of said propeller means in alignment therewith and attached to said support member; and

a steering mechanism operably mounted within said hull and operably interconnected to each of said rudder means whereby the movement of said rudders is controlled thereby.

3,924,558

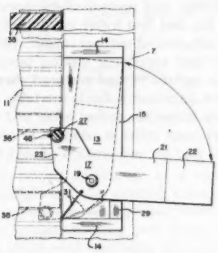
TRUCK DOOR POSITION INDICATOR

Alfred Di Grazia, 17588 Rainier Ave., Hayward, Calif. 94541

Filed Oct. 21, 1974, Ser. No. 516,455

Int. Cl.² B60Q *9/00*

U.S. Cl. 116—28 R **9 Claims**



1. A door position indicator for a door of the pull-down type installed in tracks bordering the vertical edges of a door opening in the rear end wall of the body of a truck having a driver's compartment and a rear view mirror, said door position indicator comprising indicator means, means for mounting said indicator means adjacent the rear wall of such truck body, means, when said door position indicator is so installed, for normally urging a section of said indicator means to a position lying within view of a driver via said rear view mirror with said door in its open position to indicate an open position of such door, and means responsive to the closing of such door for removing and holding said indicator means from such view of a driver, while said door remains closed.

3,924,559

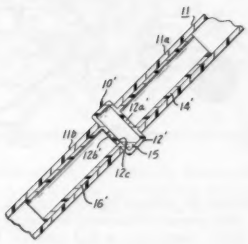
SIGNALLING DEVICE FOR PREVENTING SPILL-OVER FROM THE FUEL TANKS OF POWERED BOATS DURING FILLING

Edmund W. Renner, Jr., 40 Chestnut Ave.; Frank P. Sule, 38 Chestnut Ave., both of Berlin, N.J. 08009, and Wayne P. Sule, Chalet Apts., Blue Ridge-C, Pine Hill, N.J. 08021

Filed Oct. 31, 1974, Ser. No. 519,613

Int. Cl.² G01F *23/00*; **G08B** *21/00*

U.S. Cl. 116—109 **6 Claims**



1. A signalling device for insertion into the vent line connected to a liquid fuel tank of a boat comprising:

a. a generally cylindrical chamber having two opposed generally parallel, substantially planar walls, said walls having substantially central apertures aligned with one another for producing an audible sound signal, and

b. two substantially tubular members having generally circular cross-sections, each being fixed to the outside of one of said walls and being substantially aligned with one another and with said apertures in said wall, and being dimensioned to fit snugly and to be secured in place within said vent line.

3,924,560

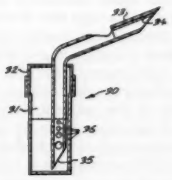
WHISTLE

Alojz Karol Kaftan, 7531 Elwell St., Burnaby, British Columbia, Canada

Filed Sept. 30, 1974, Ser. No. 510,425

Int. Cl.² G10K *5/00*

U.S. Cl. 116—140 **3 Claims**



1. A whistle comprising:

a. a chamber open at its upper end adapted to contain water,

b. a perforated cap closing the upper end of the chamber,

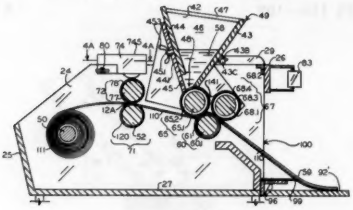
c. a tube extending through the cap and having the lower end which is bias cut immersed in the water in the chamber,

d. mouth piece and whistle opening at the upper end of the tube.

3,924,561
APPARATUS FOR DISPENSING, MEASURING, COATING AND CUTTING SHEET MATERIAL

Leonard Crawford Ruthart, 408 Taylor Lane, and Virgil Lynn Williams, 2611 Tenth Avenue, both of Canyon, Tex. 79015

Filed Sept. 10, 1973, Ser. No. 396,059
Int. Cl.² B05C *1/08*
U.S. Cl. 118—9 **2 Claims**



1. In a system for measuring, coating and dispensing textured sheet, said system comprising, in operative combination, a textured sheet comprising a first exterior hard lower textured surface with indentations therein and a second upper rough backing layer adherent to each other, and a sheet metering and dispensing and coating apparatus, said sheet metering and dispensing and coating apparatus comprising, in operative combination, a rigid main frame assembly comprising rigid longitudinally extending frame members, a sheet roll support means, a counter and drive assembly and an adhesive dispensing assembly on said frame assembly, said rigid longitudinally extending frame member including a pair of fixed mountings and a pair of vertically extending slots therein for support of elements of said counter and drive assembly, one slot and one mounting attached to each of said longitudinally extending frame members whereby each of said mountings and each of said slots in a longitudinally extending frame member is in fixed spatial relationship to each other and said sheet roll support means is adapted to support thereon a roll of said textured sheet, said sheet roll support extending transversely of said longitudinal extending frame members and supported thereon; a rigid cutting table surface attached to said main frame having a straight edge parallel to said sheet roll support;

b. said counter and drive assembly comprising, in operative combination, a first lower sheet driving counter roller, and a second upper sheet driven counter roller, drive means attached to said first sheet driving counter roller, and sheet movement sensing means attached to said second sheet driven counter roller, said second sheet driven counter roller operatively connected to said first drive roller only through said textured sheet, and

i. said first sheet driving counter roller extending parallel to said sheet roll support and including a first rotatable internal rigid support member and a compressible elastic peripheral cylindrical surface layer comprising a plurality of fine resilient fibers of varied length extending at an acute angle to said first sheet driving counter roller surface and having a diameter small than the size of the indentations in said first lower surface of said textured sheet and adapted to engage said lower textured surface of said sheet and move together with said textured sheet surface without scratching or puncture thereof; and the ends of said first rotatable internal rigid support member of said first sheet drive counter roller rotatably supported in said pair of mountings fixed to said longitudinally extending frame members,

ii. said second sheet driven counter roller comprising a rotatable rigid vertically movable internal support member having lateral ends and a rough cylindrical surface layer, said ends of said support member being rotatably and vertically movably located in said vertically extending slots, whereby said rough surface layer of said second sheet driven counter roll is adapted to yieldably rest on and engage the upper rough backing layer of one portion of the textured sheet and be rotated thereby without slippage and said second sheet driven upper counter roll is adapted to yieldably hold the lower surface of said one portion of the textured sheet against the compressible elastic peripheral cylindrical surface layer of the first sheet driving counter roller;

iii. said sheet movement sensing means comprising movable means continuously sensitive to rotary movement of said second sheet driven counter roller and operatively connected to said second sheet driven counter roller and supported, in part, on said main frame assembly, and a linear measurement indicating means supported on said main frame assembly and operatively attached to said movable means continuously sensitive to rotary motion of said second upper sheet driven roller;

c. and said adhesive dispensing assembly comprises an upwardly open liquid adhesive container with a bottom orifice at the bottom of said container, and adhesive dispensing means, said adhesive dispensing means adapted to be in operative contact at one portion thereof with said upper backing layer of said textured sheet and at another portion thereof with said bottom orifice in said liquid adhesive container, and extends the width of said textured sheet, and wherein

i. said adhesive dispensing means comprises a cylindrical driven adhesive dispenser roller rotatably supported on said liquid adhesive container with a portion of said driven adhesive dispenser roller blocking said bottom orifice, and

ii. said adhesive container has firmly attached thereto container support means removably attached to said rigid main frame and support thereon and orifice adjustment means located above said driven adhesive dispenser roller; and

iii. said adhesive dispensing means comprises an adhesive dispenser drive roller rotatably supported on said rigid main frame and operatively connected to said drive means for said first lower counter roller, and

iv. said adhesive dispenser drive roller is adapted to contact and support a second portion of said lower exterior surface of said textured sheet and said driven adhesive dispenser roller is rotatably driven by the said adhesive dispenser driver roller and said driven adhesive dispenser roller is adapted to contact the backing layer of said second portion of said textured sheet.

3,924,562
APPARATUS FOR COATING PIPE

Robert J. Harris, Marrero, and Irvin J. Lee, Gretna, both of La., assignors to H. C. Price Co.

Filed July 31, 1974, Ser. No. 493,405
Int. Cl.² B05B *13/04*
U.S. Cl. 118—320 **11 Claims**

1. Pipe coating apparatus comprising:

means for moving first and second pipe sections along spaced apart fore and aft extending paths of travel;

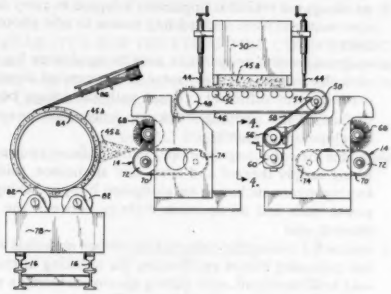
first and second coating applicators disposed adjacent to the respective paths of travel;

a coating preparation station disposed intermediate said paths of travel;

reciprocal conveyor means disposed for receiving coating material from said station and transferring the material to each of said applicators;

power means coupled with said conveyor means for moving the latter in opposite directions; and

brake means coupled with said power means and operable to slow said power means when moving said conveyor



means in one direction prior to movement of said conveyor means in the opposite direction.

3,924,563

VAPOR DEPOSITION ON ELECTROSTATICALLY TENSIONED FOIL

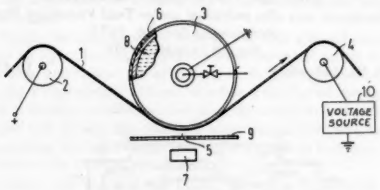
Hartmut Kessler, and Hubert Kraus, both of Regensburg, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jan. 9, 1974, Ser. No. 431,851

Claims priority, application Germany, Mar. 7, 1973, 2311217

Int. Cl.² C23C *13/08*

U.S. Cl. 118—49.1 **3 Claims**



1. Apparatus for vapor deposition of a metal layer to a plastic foil comprising a metallic cooling drum rotatably supported, an insulating layer covering the cylindrical surface of said cooling drum, means moving said plastic foil with one surface entrained about said insulating layer on said cooling drum, means for applying a metallized layer to the opposed surface of said plastic foil at the area of entrainment and voltage means for applying an electrostatic field between said cooling drum and said plastic foil including an electrically conducting roller engageable with the metallized side of the plastic foil.

3,924,564

FUSING APPARATUS HAVING AN ARTICULATED RELEASE MATERIAL DISPENSER

Ari Bar-on, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

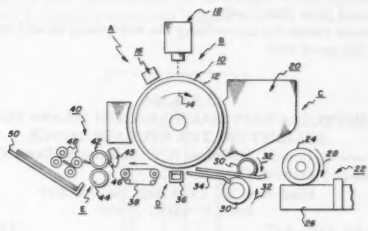
Filed Jan. 13, 1975, Ser. No. 540,731

Int. Cl.² G03G *13/08*

U.S. Cl. 118—60 **14 Claims**

1. In an electrostatographic printing machine, an apparatus for dispensing a quantity of release material to a heated fuser member operatively associated with a backup member wherein a sheet of support material having particles thereon passes therebetween with the particles contacting the fuser member, including:

means for applying the release material to the surface of the fuser member; and



means for automatically, periodically moving the applying means into and out of engagement with the surface of the continuously operating fuser member to apply the release material thereto.

3,924,565

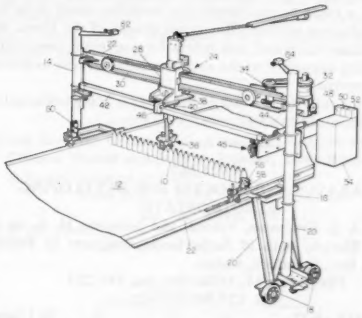
SPRAYING APPARATUS

Robert A. Benner, Toledo, Ohio; Philip H. Fisher, Lambertville, Mich., and Carl L. Parlette, Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 13, 1974, Ser. No. 532,581

Int. Cl.² B05B *3/00*

U.S. Cl. 118—323 **12 Claims**



1. In an apparatus for spraying objects arrayed in rows and columns that are continuously moved by a conveying means wherein a traversing spray unit is mounted on support columns positioned on opposite sides of said conveying means and extends transversely across said conveying means, and wherein said traversing spray unit includes a movable carriage that is moved by a drive means in a linear path back and forth transversely across said conveying means, the improvement in said apparatus which comprises, in combination:

a control rail extending transversely across said conveying means;

means for pivotally mounting said control rail adjacent one of said support columns in a location below said traversing spray unit;

reciprocating motor means mounted adjacent the other one of said support columns;

means for connecting the free end of said control rail to said motor means, whereby said motor means can move said control rail about said means for pivotally mounting said control rail;

a slide plate, carried by said movable carriage and slideably mounted thereon for longitudinal movement relative to said conveying means;

a sliding shoe, engaged on said control rail and connected to said slide plate;

at least one downwardly directed spray means carried by said slide plate; and

circuit means for controlling the movement of said traversing spray unit.

3,924,566

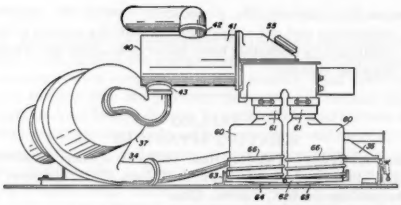
REPRODUCTION MACHINE WITH MEANS FOR SOLIDIFYING THE RECLAIM TONER

Richard H. Dennie, Macedon, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 25, 1974, Ser. No. 527,119

Int. Cl.² G03G *21/00*

U.S. Cl. 118—637 **3 Claims**



1. An improved electrostatic reproduction machine having a photoconductive surface upon which is formed an electrostatic latent image, developing apparatus for applying developing material comprising toner to the latent image to develop the same, a cleaning mechanism for removing toner from the photoconductive surface after development of the latent image, a reclaim container, and means for conveying toner from the cleaning apparatus to the reclaim container, the improvement comprising:

means for solidifying toner as the latter is being collected in the reclaim container.

3,924,567

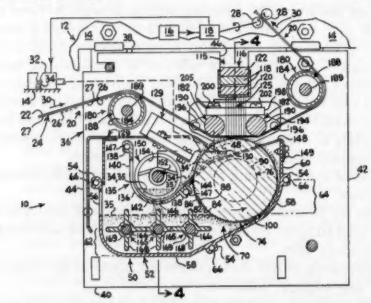
APPARATUS AND PROCESS FOR DEVELOPING ELECTROSTATIC

Geradus A. J. Koeleman, Velden, and Johannes H. A. op de Laak, Bierick, both of Netherlands, assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Mar. 14, 1974, Ser. No. 451,254

Int. Cl.² B05B *5/02*

U.S. Cl. 118—637 **16 Claims**



1. In a copier including a movable strip-type photoconductor having a surface adapted to carry a developable electrostatic latent image, and means for dispensing a replenishing supply of developer material, apparatus for developing the electrostatic latent image comprising:

a. means for holding a working supply of developer material;

b. an elongated rotatable applicator adapted to carry developer material from said holding means to said photoconductor;

c. magnetic means cooperative with the applicator for magnetically bringing at least some of the carried developer material into sufficient contact with the image bearing surface of the photoconductor to brush said image for development thereof;

d. means for collecting developer material from said replenishing supply thereof and from said applicator, said collecting means including an elongated hopper having opposite ends and an aperture midway between the ends thereof; and

e. means for mixing the collected developer materials within the collecting means and feeding the resulting mixture to said holding means, said mixing means including a rotatable shaft and a pair of elongated spiral members, the shaft extending longitudinally of the hopper, the spiral members respectively coiling in opposite directions around the shaft and longitudinally extending towards one another from the opposite ends of the hopper, and said spiral members fixedly secured to the shaft for rotation therewith so as to permit the rotating spiral members to feed the resulting mixture of developer materials to the hopper aperture for discharge therethrough to the holding means.

3,924,568

APPARATUS FOR DEVELOPING LATENT ELECTROSTATIC IMAGES

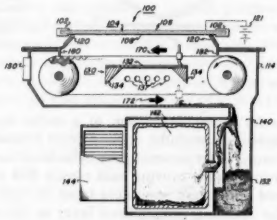
Lothar S. Jeromin, Sierra Madre, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 15, 1973, Ser. No. 323,666

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² G03G *13/08*

U.S. Cl. 118—637 **19 Claims**



1. Apparatus for developing a latent electrostatic image formed on the surface of an insulating member comprising:

a chamber having a pair of opposed sidewalls,

means for supporting said insulating member, said surface facing said chamber,

means for supplying a cloud of charged developer particles to said chamber through a port in one of said opposed sidewalls,

means for supplying gas through a port in the other of said opposed sidewalls,

a baffle overlying said ports through which said developer particles and said gas are introduced into said chamber whereby said gas and developer particles mix under said baffle, said baffle comprising a conductive upper portion which is electrically floating and which faces the surface of said insulating member, said insulating member overlying a conductive substrate, and

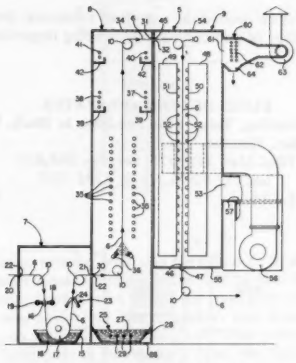
means for biasing said conductive substrate to a predetermined potential whereby the electric field between said surface and said conductive baffle portion and said chamber bottom is substantially uniform.

3,924,569

APPARATUS FOR TREATING TIRE CORD FABRIC

Edward E. Hunter, Akron, and Grover W. Rye, Cuyahoga Falls, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 28, 1974, Ser. No. 501,413
Int. Cl.² B05B *5/00*
U.S. Cl. 118—642 **26 Claims**



1. An apparatus for treating tire cord fabric, comprising in combination:

a. means for coating a tire cord fabric with a liquid mixture of an agent for promoting the bond between cords of the fabric and rubber material used in the production of tires, and a vaporizable solvent which is a carrier of the agent;
b. a drying chamber sealed from the ambient atmosphere and said means, the chamber including an inlet and outlet opening through which the fabric passes as it enters and leaves the chamber, respectively;
c. means for guiding the fabric successively through the means for coating the fabric and the chamber;
d. means for filling the chamber with vapor of a solvent which is similar to the solvent of the mixture;
e. means for condensing solvent vapor accumulating near the inlet and outlet openings;
f. at least one radiant heater disposed in the chamber in spaced relation from fabric moving past the heater, for heating and vaporizing solvent carrier on the fabric; and
g. means for guiding the fabric between the heaters.

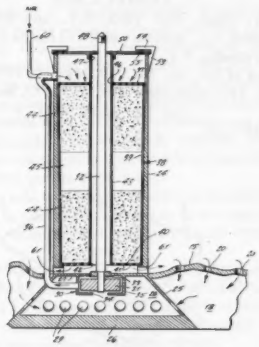
3,924,570

AQUARIUM SCENIC FILTER IN FISH TANK

Mercurio Lamonica, 7214 17th Ave., 1st Floor, Brooklyn, N.Y. 11204

Filed Sept. 13, 1974, Ser. No. 505,648
Int. Cl.² A01K *63/00*
U.S. Cl. 119—5 **2 Claims**

1. In an aquarium scenic filter for a fish tank, the combination of a hollow base, an upstanding filter container supported by said base, and a removable end cap upon a top of said container, said hollow base consists of a top wall integral with downward side and end walls forming a base chamber, said top wall being perforated throughout its entire area with small openings, and a upper side of said top wall being contoured to resemble a bottom of a sea, lake or river and being accordingly colored, said container contains a vessel filled with layers of charcoal and fiberglass, a water pump within a lower end of said container being connected to a tube which at its other end is connected to an upper position of said container in order to pour pumped water upon said filter containing vessel, wherein an air vent tube is connected to an intermediate portion of said tube so that air is merged with said water, wherein L-shaped projections integral with an outside side of



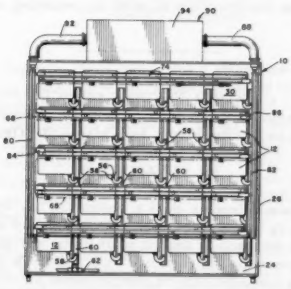
said container each includes a radially inward arm for bearing down upon a circular plate of said end cap, said plate including peripheral notches to clear said arms when being vertically placed upon said container and prior to being rotated under said arms, wherein an electric motor is mounted upon said end cap plate, a disengagable motor shaft of said motor extending downwardly through a central tube integral with said vessel, and a lower end of said shaft being connected to a water impeller of said pump.

3,924,571

ANIMAL CAGING SYSTEM

Frank Brouwer Holman, Lakewood, N.J., assignor to Lorraine Chirico, Howell and John R. Fulcher, Toms River, both of, N.J., part interest to each

Filed Dec. 7, 1973, Ser. No. 422,901
Int. Cl.² A01K *1/02*
U.S. Cl. 119—15 **6 Claims**



1. A system for caging animals comprising a battery of independent closed wall cages, an air purification means and means connecting the output of said air purification means to each cage in an individual manner so that each cage is supplied with bacteria free air and means connecting each cage to exhaust its dirty air on an individual basis back to said air

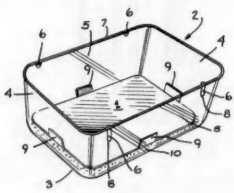
purification means whereby cross contamination from animal to animal housed in the cages is prevented, said connecting means comprising an elongated double plenum duct in fluid communication with a plurality of said cages, one plenum of said double plenum duct supplying purified air to each of said cages, the other plenum of said double plenum duct exhausting dirty air from each of said cages.

3,924,572

ANIMAL CAGE

Anthony V. Classe, New York, N.Y., and Robert P. Mehn, Middletown, N.J., assignors to IPCO Hospital Supply Corporation, Valhalla, N.Y.

Division of Ser. No. 254,898, May 19, 1972, Pat. No. 3,826,229. This application Nov. 21, 1973, Ser. No. 418,084
Int. Cl.[2] A01K *1/00*
U.S. Cl. 119—17 **7 Claims**



1. An animal cage having a bottom wall and integral upstanding side and end walls having an upper edge, a layer of particulate bedding material on said bottom wall, a solid imperforate retaining element mounted in said cage and adjacent the bottom wall to retain the bedding material in said cage, said retaining element being in close adjacency to said bedding material, said bedding material substantially filling the entire space between the retaining element and the bottom wall, said retaining element being removably mounted within the container to expose said bedding material, means on said retaining element for holding the retaining element within the container, said means comprising spaced locking tabs extending from the retaining element and biased outwardly to bear against the walls of the cage, the distance between the retaining element and the upper edge being substantially greater than the distance between the retaining element and the bottom wall, said holding means mounted on the retaining element and having a portion thereof extending therefrom to bear against the side walls to hold the retaining element in place.

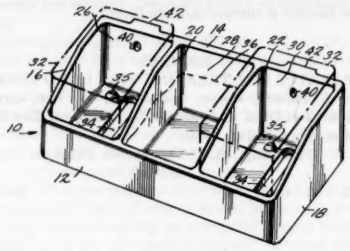
3,924,573

ANIMAL FEEDING DEVICE

Wil B. Thomas, and Fred Boggs, both of Marysville, Ohio, assignors to Riverby Farms, Inc., Marysville, Ohio

Filed Jan. 8, 1974, Ser. No. 431,776
Int. Cl.[2] A01K *5/00*
U.S. Cl. 119—61 **3 Claims**

2. An animal feeding device comprising an opentopped box-like body having front, rear, bottom and end walls and a plurality of horizontally spaced apart planar partitions which extend between the front and rear walls and divide the interior of the body into a plurality of compartments for holding solid animal feed substances, said rear wall including at least one rearwardly projecting spacer portion which effects an air space between said rear wall and any vertical support surface to which it may be attached, a major portion of the open tops of said compartments lying in an inclined plane extending downwardly and forwardly, the bottom wall in at least one of said compartments having an aperture therethrough, means in said one compartment for supporting a solid feed substance therein at an elevation above the bottom wall so as to allow



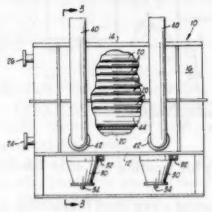
circulation of air around the solid feed substance, the bottom wall in another of said compartments being impervious.

3,924,574

FLUID HEATER APPARATUS

Harold O. Ebeling, Tulsa, Okla., assignor to Black, Sivalls & Bryson, Inc., Houston, Tex.

Filed Mar. 21, 1975, Ser. No. 560,821
Int. Cl.[2] F22B *31/00*; **F23J** *5/02*
U.S. Cl. 122—23 **9 Claims**



1. In a fluid heater apparatus having a firing wall, a back wall and side walls defining a furnace space, a plurality of fluid heating tubes disposed in said furnace space and one or more high intensity combustion burners attached to said firing wall and positioned so that combustion gases produced by the burners are directed into said furnace space, impinge on said back wall and are caused to circulate around said heating tubes thereby bringing about the transfer of heat from said combustion gases to the fluid being heated, the improvement which comprises:

at least one baffle disposed in said furnace space adjacent to said firing wall defining a secondary chamber within said furnace space between said firing wall and said baffle so that at least a portion of said combustion gases produced by said burner or burners impinge on said baffle after impinging on said back wall and are caused to recirculate around said heating tubes; and

at least one stack attached to said walls defining said furnace space and communicating with said secondary chamber so that combustion gases are withdrawn from said furnace space through said secondary chamber.

3,924,575

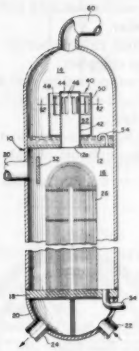
FLUID HEATING AND SEPARATING APPARATUS

Albert John Zipay, Clifton, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Nov. 20, 1974, Ser. No. 525,429
Int. Cl.[2] F22B *1/02*
U.S. Cl. 122—34 **7 Claims**

1. A fluid heating and separating apparatus comprising a pressure vessel, means defining an upper separating chamber

and a lower heating chamber in said vessel, an inlet communicating with the upper portion of said heating chamber for introducing a relatively hot fluid into said heating chamber, a plurality of tubes in said heating chamber, means for passing a relatively cool fluid from an external source through said tubes, the relatively heavy portion of said hot fluid passing downwardly in said heating chamber across said tubes in a



heat exchange relation with said cool fluid to heat said cool fluid, means connecting said chambers to permit the passage of the relative light portion of said hot fluid from said heating chamber into said separating chamber, and means in said separating chamber for separating the vapor portion of said relatively light portion of hot fluid from the liquid portion thereof.

3,924,576

STAGED COMBUSTION ENGINES AND METHODS OF OPERATION

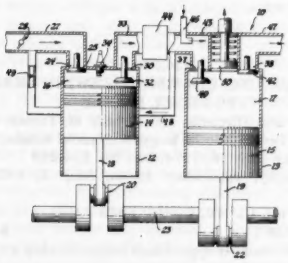
Robert M. Siewert, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 252,853, May 12, 1972. This application Aug. 21, 1972, Ser. No. 282,390

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] **F02B** *75/10, 75/12*

U.S. Cl. 123—1 R **6 Claims**



4. The method of operating an internal combustion engine of the type having at least two expansible chambers that execute successive expanding and contracting strokes and each supplies net energy per cycle to a rotating shaft, the method comprising the steps of:

a. successively supplying to one of said chambers a mixture composed primarily of air and hydrocarbon fuel in combustion supporting proportions with an excess of fuel over stoichiometric so as to produce, upon combustion, gases having low residuals of nitrogen oxides and high residuals of combustibles primarily in the form of H_2 and CO;

b. successively compressing, burning, and expanding said mixtures in said one chamber to deliver primary energy to the rotating shaft and to produce interstage gases having substantial amounts of incompletely burned fuel but low in nitrogen oxides;

c. varying the temperature of the interstage gases to control said temperature within a desired range, selected to assure self-ignition of the subsequently formed mixtures near the end of the second compression step (d);

d. successively deliverying said temperature controlled interstage gases to the other of said chambers, together with air in amount sufficient to provide mixtures having (1) overall engine air-fuel ratios leaner than stoichiometric, (2) available total energy substantially less than that of the hydrocarbon fuel originally supplied, and (3) a capability of compression ignition when compressed in a predetermined compression ratio;

e. compressing said successive last mixture in said predetermined ratio in said other chamber so as to cause self-ignition of said mixtures near the end of such compression step; and

f. successively burning and expanding the mixtures in the last mentioned chamber without substantial additional compression to deliver secondary energy to the rotating shaft while producing exhaust gases having low residuals of both nitrogen oxides and combustibles.

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3,924,577

ACCESSORY SHAFT DRIVE FOR A ROTARY MACHINE

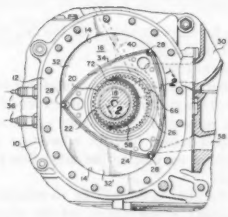
Erkki A. Koivunen, Livonia, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 11, 1973, Ser. No. 405,495

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] **F02B** *67/04*

U.S. Cl. 123—8.01 **4 Claims**

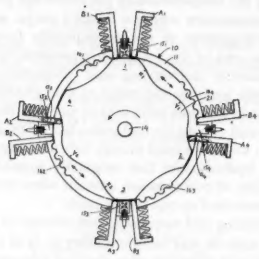


1. In a rotary machine comprising a cylindrical housing, a side housing closing each side of said cylindrical housing, said cylindrical housing having an internal peripheral wall cooperating with end walls of said side housings defining a cavity therein, a crankshaft rotatably mounted in said side housings and extending through said cavity, a rotor rotatably mounted on said crankshaft for rotation within said cavity, a fixed phasing gear attached to one of said side housings, a phasing gear secured to said rotor and meshing with said fixed gear so that said rotor rotates and planetates relative to said crankshaft, an accessory drive shaft rotatably mounted in said one of said side housings adjacent said crankshaft, a driven gear attached to said accessory shaft, and a cylindrical drive gear attached to said crankshaft and extending axially therealong overlying said fixed phasing gear and meshing with said accessory shaft driven gear rotating said accessory shaft with said crankshaft, said cylindrical drive gear having a circumferential slot therein permitting meshing engagement between said fixed phasing gear and said rotor phasing gear.

3,924,578
ROTARY INTERNAL COMBUSTION ENGINE

Donald E. Howard, 3382 Aletha Drive, Baton Rouge, La. 70814

Filed Mar. 1, 1974, Ser. No. 447,283
Int. Cl.² F02B 53/04
U.S. Cl. 123—8.13 21 Claims



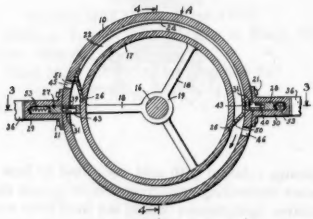
1. In a rotary engine for the intake and combustion of a fuel and air mixture which includes the combination of
a stator formed by an outer casing,
a rotor coaxially mounted and rotatable within said outer casing,
a plurality of main chambers located within the annulus between the inside wall of the stator casing and external wall surface of the rotor, each being formed by lobes which extend from the external wall surface of the rotor into sliding contact with the inside wall of said stator casing, these including a main firing chamber,
input means for the introduction of a gaseous combustible mixture of fuel and air into a main chamber of the engine, means for compressing and firing the fuel and air mixture within a primary firing chamber, the volume of the main firing chamber expanding as thrust is imparted by the combusting gaseous mixture to produce rotation of said rotor, and
output means for the exhaust of the burned fuel from a main chamber of the engine,
the improvement comprising
minor chambers formed by recesses located within the inside wall of the stator for the incremental feeding of fuel admixtures into said main firing chamber and for the bypass of combusted fuel for admixture with fresh fuel and subsequent recycle to the main firing chamber, and wherein said
main firing chamber is contoured to provide for an initial rapid increasing of the rate of volume expansion of combusting fuel to moderate the rise in temperature and suppress the formation of nitrous oxides, with a subsequent decreasing of the rate of volume expansion to sustain the moderated temperature and enhance a more complete combustion of the fuel, and then a subsequent increasing of the rate of volume expansion as combustion subsides to provide an increased area for receipt of generated forces through an elongated section to more fully utilize the forces produced.

3,924,579
ROTARY INTERNAL COMBUSTION ENGINE

Paul B. Johnson, 12077 Custer St., Yucaipa, Calif. 92399

Filed Mar. 22, 1974, Ser. No. 453,682
Int. Cl.² F02B 53/08
U.S. Cl. 123—8.23 2 Claims

1. An engine comprising
a cylindrical stator having end walls,
a first partition ring within said stator intermediate said walls,
a cylindrical rotor rotatable within said stator,
said rotor being concentric with stator,
said stator, ring and rotor forming an intake-compression chamber and a combustion-exhaust chamber,
a first camming member on said rotor in sealing engagement with said intake-compression chamber,
a second camming member on said rotor in sealing engagement with said combustion-exhaust chamber,
a first sealing gate supported by said stator for movement radially relative to said rotor into and out of said intake-compression chamber,
said gate having a first cavity therein openable into said intake-compression chamber,
a second sealing gate supported by said stator for movement radially relative to said rotor into and out of said combustion-exhaust chamber,
said second gate having a second cavity therein openable into said combustion-exhaust chamber,



said first and second cavities being in communication with each other,
said first camming member being effective to cam said first gate out of said intake-compression chamber and to close said first cavity from said intake-compression chamber,
said second camming member being effective to cam said second gate out of said combustion-exhaust chamber and to close said second cavity when said first cavity is open to said intake-combustion chamber,
means to convey combustible fuel to said intake-compression chamber,
a device for causing ignition in said cavities,
means to convey products of combustion from said combustion-exhaust chamber,
said camming members being yieldable radially outwardly from said rotor.

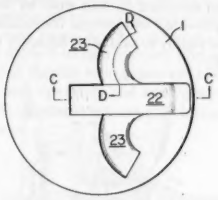
3,924,580
MAIN COMBUSTION CHAMBER OF SWIRL CHAMBER TYPE DIESEL ENGINE

Kaoru Taira, and Hirotoshi Inoue, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Nov. 15, 1974, Ser. No. 524,259
Claims priority, application Japan, May 2, 1974, 49-49547[U]
Int. Cl.² F02F 3/26; F02B 23/02
U.S. Cl. 123—30 C 3 Claims

1. In a swirl chamber type diesel engine having a cylinder with a piston slidable therein,
a main combustion chamber defined in said piston, said main combustion chamber comprising a straight inclined groove formed in the top surface of said piston, said straight groove extending diametrically from an edge portion of said surface and becoming shallower as the groove extends inward from said edge portion, said main combustion chamber further comprising a pair of branched inclined grooves extending from said straight

inclined groove, each one of said pair of grooves being curved and having a portion curving back toward said



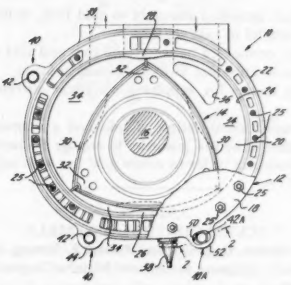
edge portion, and each one of said pair of grooves becoming shallower as it extends from said straight groove.

3,924,581

DOWELING CONSTRUCTION FOR ROTARY ENGINE HOUSING

Charles Jones, Hillsdale, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Dec. 6, 1974, Ser. No. 530,288
Int. Cl.² F02B *53/00*
U.S. Cl. 123—8.45 **5 Claims**



1. In a rotary internal combustion engine having a housing consisting of a pair of spaced, substantially parallel end walls and a peripheral wall having a trochoidal shaped inner surface, the end and peripheral walls defining therebetween a cavity in which a rotor is mounted for planetary rotation and which defines with said walls working chambers which successively expand and contract in volumetric size as the rotor rotates relative to the housing, wherein combustion occurs in the working chambers adjacent one area of the housing exposing that area to relatively higher temperatures and pressures than in the remainder of the housing whereby said area is subjected to high stresses, and wherein at least one end wall and the peripheral wall have different rates of expansion than the other housing walls which differential expansion would tend to subject the housing to additional stress, an improved dowel structure for maintaining alignment of said end walls and peripheral wall, comprising:

a. at least two dowels disposed in the high stress area on opposite sides of the lobe junction in this area of high stress and extending through said end walls and peripheral wall;

b. one of the dowels being disposed to project through an elongated opening in the end wall having a different rate of expansion; and

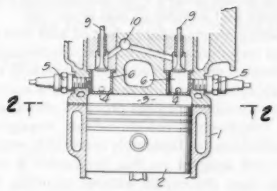
c. said elongated opening having a longitudinal axis extending in a direction to obviate the additional resultant stress loading on the housing arising out of the differential rate of expansion between the end wall and said peripheral wall.

3,924,582

AUXILIARY CHAMBERS FOR INTERNAL COMBUSTION PISTON ENGINES

Shizuo Yagi; Kiyoshi Miyaki, both of Osaka, and Hiroshi Kogure, Tokorozawa, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 4, 1974, Ser. No. 439,127
Claims priority, application Japan, Feb. 14, 1973, 48-17412
Int. Cl.² F02B *19/10, 19/18*
U.S. Cl. 123—32 SP **4 Claims**



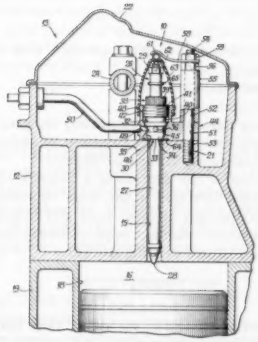
1. In an internal combustion piston engine having a valved intake passage for supplying a lean mixture to a main combustion chamber and a valved exhaust passage leading from said chamber, the improvement comprising, in combination: two auxiliary combustion chambers diametrically opposed and symmetrically positioned with respect to the main combustion chamber, ignition means associated with each auxiliary chamber, passage means for supplying the rich mixture to each of said auxiliary chambers, each auxiliary chamber having an auxiliary intake valve controlling flow of rich mixture thereto, respectively, and each having a torch nozzle connecting each auxiliary chamber to said main chamber, respectively, the torch nozzles extending in opposite directions with respect to a plane containing the centers of said auxiliary chambers.

3,924,583

MOUNTING APPARATUS

Thomas K. Jardin, Oxnard, Calif., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed June 21, 1974, Ser. No. 481,799
Int. Cl.² B05B *1/30*
U.S. Cl. 123—32 JV **9 Claims**



1. An improved mounting apparatus, for use in combination with an internal combustion engine having a fuel injection nozzle, a fuel supply line and a cylinder head with the head having a substantially smooth nozzle-receiving bore, comprising:

means forming an external frustoconical surface on said nozzle;

an adapter having an elongated opening therethrough registerable with the nozzle-receiving bore in the head, which opening has an internal frustoconical surface positionable in mating engagement with said external frustoconical surface of said nozzle for supporting the nozzle in predetermined axially extended relation in said bore;

means for operatively connecting said fuel supply line to the adapter and including passage means for supplying fuel therefrom into the nozzle;

first fastening means spaced from said opening for detachably securing said adapter to said head; and

second fastening means independent of said first fastening means and including an internally screw-threaded protuberance formed upon said adapter in coaxially extending relation above said opening thereof and a mating externally screw-threaded member provided about said nozzle which is selectively screw-threadably engageable with said protuberance for separately removably securing said nozzle to said adapter so that the nozzle is selectively removable from the engine without requiring the disassembly of the adapter from the cylinder head or any disturbance of the fuel supply line.

3,924,584

INTERNAL COMBUSTION ENGINE OPERATED BY A LAYERED CHARGE

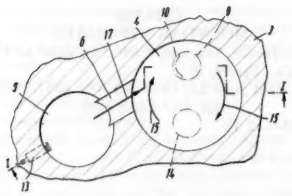
Gerd Decker, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Mar. 6, 1974, Ser. No. 448,499

Claims priority, application Germany, Mar. 12, 1973, 2313201

Int. Cl.² F02B *3/00*

U.S. Cl. 123—32 ST **7 Claims**



1. Internal combustion engine operated with a stratified charge, comprising:

a. a main combustion chamber;

b. a precombustion chamber;

c. a connecting channel interconnecting the precombustion chamber with the main combustion chamber and disposed approximately tangential thereto;

d. means operative for generating a twisting current in a predetermined direction in the main combustion chamber, said connecting channel issue discharging into the main combustion chamber approximately tangential to the direction of said twisting current.

3,924,585

ELECTROMAGNETIC FAN CLUTCH FOR A WATER-COOLED VEHICLE ENGINE

Robert L. Woods, Mesquite, Tex., assignor to Eagle-Motive Industries, Inc., Fort Worth, Tex.

Filed Jan. 23, 1975, Ser. No. 543,469

Int. Cl.² F16D *27/10, 43/25*

U.S. Cl. 123—41.12 **4 Claims**

1. An electromagnetic clutch for the radiator cooling fan of a motor vehicle engine comprising:

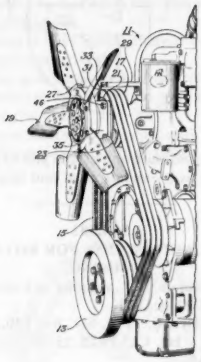
a shaft having one end adapted to bolt to the fan mounting of said engine,

a field coil carried concentrically on said shaft by bearings,

a housing of non-magnetic material carried forwardly of said coil and mounted on said shaft by bearings,

said housing provided with means for mounting a fan,

a hub attached rigidly to said shaft adjacent the forward end of said shaft,



an armature mounted movably to said hub, movable in a plane parallel to said shaft,

bias means connected between said hub and said armature urging said armature away from said housing,

energizing means for supplying electrical current to said coil,

whereby upon energization of said coil a magnetic force draws said armature inwardly to engage frictionally with said housing in order to rotate said fan with said shaft.

3,924,586

VACUUM CONTROL ASSEMBLY

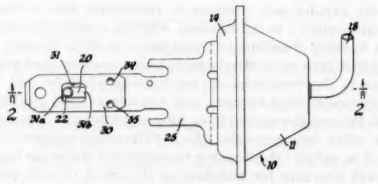
Clarence L. Julian, Daleville, and Robert E. Young, Anderson, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed May 3, 1973, Ser. No. 356,724

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² F02P *5/04*

U.S. Cl. 123—117 A **1 Claim**



1. A vacuum control assembly for operating the breaker plate of an automotive type ignition distributor to provide ignition spark vacuum advance for an associated internal combustion engine comprising, a vacuum unit including at least a casing, a diaphragm enclosed within said casing in such a manner as to provide a vacuum chamber, a spring interposed between said diaphragm and said casing for urging said diaphragm in a first direction, a vacuum port communicating with said vacuum chamber and an operating rod oscillated linearly by said diaphragm having an elongated portion secured to said diaphragm and an operating end portion extending substantially normal to said elongated portion for opera-

tively engaging said breaker plate, a mounting bracket rigidly secured to said casing and extending in a direction along said operating rod, and a range bracket member having an elongated slot of a length determined by the desired range of degrees of ignition spark vacuum advance from zero to maximum which accommodates said operating end portion of said operating rod, said range bracket member, with a predetermined vacuum applied to said vacuum port, being positioned with one end wall thereof in engagement with said operating end portion of said operating rod and rigidly secured to said mounting bracket member whereby an initial compression is set in said spring.

3,924,587

EXHAUST GAS RECIRCULATION SYSTEM

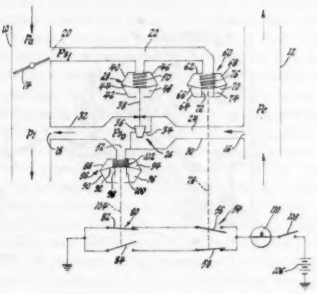
Michael P. Murphy, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 5, 1973, Ser. No. 412,867

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] F02M *25/06*

U.S. Cl. 123—119 A **2 Claims**



1. In an internal combustion engine, the combination comprising: means including an intake passage through which ambient air is drawn into the engine from the surrounding atmosphere; means including an exhaust passage through which exhaust gases are forced from the engine into the surrounding atmosphere; means responsive to the operation of the engine for developing an input signal pressure which differs from the atmospheric pressure by more than a first predetermined amount when the recirculation of exhaust gases from the exhaust passage to the intake passage is desired and which differs from the atmospheric pressure by less than the first predetermined amount when the recirculation of exhaust gases from the exhaust passage to the intake passage is not desired; means including a recirculation valve responsive to the input signal pressure and coupled between the exhaust passage and the intake passage for opening to permit the recirculation of exhaust gases from the exhaust passage to the intake passage through the valve when the input signal pressure differs from the atmospheric pressure by more than the first predetermined amount and for closing to prohibit the recirculation of exhaust gases from the exhaust passage to the intake passage through the valve when the input signal pressure differs from the atmospheric pressure by less than the first predetermined amount; means responsive to operation of the recirculation valve for developing an output signal pressure which differs from the atmospheric pressure by more than a second predetermined amount when the recirculation valve is closed and which differs from the atmospheric pressure by less than the second predetermined amount when the recirculation valve is open; and means responsive to the input and output signal pressures for indicating that the recirculation valve is stuck closed when the input signal pressure differs from the atmospheric pressure by more than the first predetermined amount and the output signal pressure differs from the atmospheric pressure by more than the second predetermined amount or for indicating that the recirculation valve is stuck open when the input signal pressure differs from the atmospheric pressure by less than the first predetermined amount and the output signal pressure differs from the atmospheric pressure by less than the second predetermined amount.

3,924,588

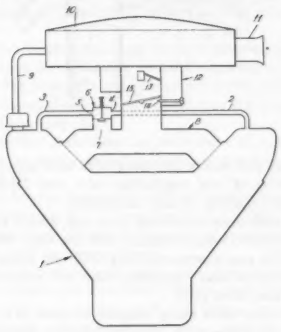
POSITIVE CRANKCASE VENTILATION SYSTEM

Lowell T. Hager, 401 Dayton Ave., West Chicago, Ill. 60185

Filed Jan. 18, 1974, Ser. No. 434,669

Int. Cl.[2] F02B *33/00*

U.S. Cl. 123—119 B **5 Claims**



1. A positive crankcase ventilating system for an engine having a carburetor and an intake manifold and a crankcase including gas flow connections between crankcase and intake manifold and between crankcase and carburetor air intake, in combination, a flow control valve interposed in the crankcase-intake manifold connection, said flow control valve being a spring poppet valve oriented to permit flow from the crankcase into the intake manifold, the extent of opening of said valve from the extreme positions of closed to full open being progressively responsive to the degree of vacuum in the intake manifold, the force applied by the spring of said poppet valve tending to close the valve against the pull of the vacuum in the intake manifold being such that the valve is only partly open when the engine is idling, is closed during substantial acceleration, and is full open during substantial deceleration.

3,924,589

EXHAUST GAS RECIRCULATING APPARATUS

Hidetaka Nohira, and Kiyoshi Kobashi, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 369,002, June 11, 1973, abandoned. This application Oct. 31, 1974, Ser. No. 519,642

Claims priority, application Japan, Mar. 17, 1973, 48-31311

Int. Cl.[2] F02M *25/06*

U.S. Cl. 123—119 A **7 Claims**

1. An exhaust gas recirculating apparatus associated with an engine on a motor vehicle or the like, comprising:

a regulating valve, the inlet of which is communicated with an exhaust manifold and the outlet of which is communicated with an intake manifold, said regulating valve including:

an actuating rod member,

an upper diaphragm secured to the upper end of said rod member,

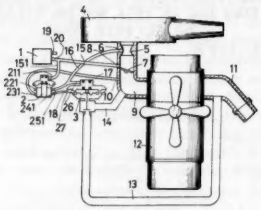
a lower diaphragm smaller than said upper diaphragm and secured to said rod member in a position below said upper diaphragm,

an upper actuating chamber defined above said upper diaphragm,

and a lower actuating chamber defined between said upper and lower diaphragms;

and a changeover device for selectively actuating said regulating valve, including

a diaphragm defining an actuating chamber provided with a first port communicating with a carburetor,



a second port communicating with said upper actuating chamber of said regulating valve and further with a Venturi portion of said carburetor,

a third port communicating with said intake manifold,

a fourth port communicating with the open air,

and a fifth port communicating with said lower actuating chamber of said regulating valve and communicatable with said third port;

said regulating valve being adapted to open to a controlled degree upon elevation of the pressure in said lower actuating chamber to nearly the atmospheric pressure, while closing upon elevation of the pressure in said upper actuating chamber to nearly the atmospheric pressure.

3,924,590

INTAKE ARRANGEMENT OF AN INTERNAL COMBUSTION ENGINE

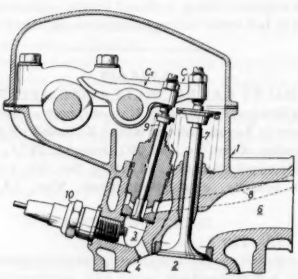
Kiyoshi Miyaki, Asaka, and Hiroshi Kogure, Tokorozawa, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 22, 1973, Ser. No. 372,679

Claims priority, application Japan, June 30, 1972, 47-77408

Int. Cl.[2] F02M *31/00;* **F02B** *75/02*

U.S. Cl. 123—122 AB **2 Claims**



1. In an internal combustion engine, the combination of a main combustion chamber for a lean air-fuel mixture and a smaller auxiliary combustion chamber for a rich air-fuel mixture, the chambers being connected by a torch passage, the main combustion chamber being provided with an exhaust valve and a main inlet valve and the auxiliary combustion chamber being provided with an inlet valve, a cast body having an elongated exhaust passage formed therein and controlled by the exhaust valve, said cast body also having an elongated main intake passage formed therein for a lean air-fuel mixture controlled by the main inlet valve, said exhaust and main intake passages being substantially parallel, an elongated auxiliary intake passage formed in said cast body and positioned between said other passages and extending downward at an angle with respect to them toward said auxiliary chamber, all three passages being disposed in heat conductive relation whereby the rich air-fuel mixture is heated to a greater extent than the lean air-fuel mixture.

3,924,591

QUICK WARM-UP INTAKE MANIFOLD

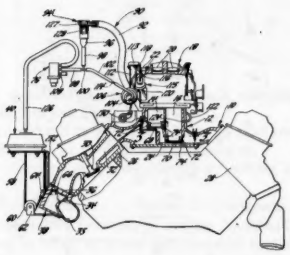
William D. Bond, Warren, and Bruce E. Zemke, Birmingham, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 4, 1973, Ser. No. 394,188

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] F02M *31/00*

U.S. Cl. 123—122 H **4 Claims**

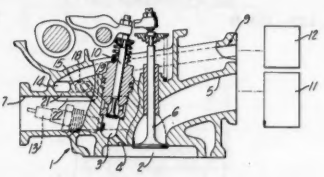


1. A fuel supply system for an internal combustion engine of the type including an intake manifold having a cross-over passageway therein including a thin plate stove exposed on one surface thereof to air-fuel flow to the intake manifold and to exhaust flow on the opposite surface thereof through the cross-over passageway, the improvement comprising: vacuum actuated heat riser valve means having an opened and a closed position, a thermally responsive vacuum control device having means sensing the engine coolant temperature and valve means responsive thereto to selectively direct vacuum to the vacuum actuated heat valve means below a predetermined coolant temperature for maintaining it in its closed position to divert exhaust flow through the crossover passageway during an early fuel evaporation phase of control and operative above the predetermined coolant temperature to direct atmospheric pressure to the heat valve means to open the heat riser valve means to reduce exhaust flow through the crossover passage following the early fuel evaporation phase of operation, a carburetor including a choke for supplying an air-fuel mixture to the intake manifold, means including a vacuum operator to pull the choke open to a start position immediately after the engine has started, and means for continuing opening of the choke at a reduced rate from the start position to a full open position following a predetermined time period, said vacuum operated heat riser valve means maintaining heat flow to the stove during the choke opening period and for a period thereafter to assure vaporization of liquid fuel droplets flowing from the carburetor against the stove, said thermally responsive vacuum control device conditioning said heat riser valve means upon a predetermined increase in engine coolant temperature to open said riser valve means to prevent the heating of the stove and air-fuel flow into the engine once the engine is at a predetermined temperature as reflected by the predetermined increase in engine coolant temperature.

3,924,592
INTAKE SYSTEM FOR THREE-VALVE INTERNAL COMBUSTION ENGINE

Kiyoshi Miyaki, Asaka, and Hiroshi Kogure, Tokorozawa, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 29, 1973, Ser. No. 420,226
Int. Cl.² F02M *31/00*
U.S. Cl. 123—122 AB **6 Claims**

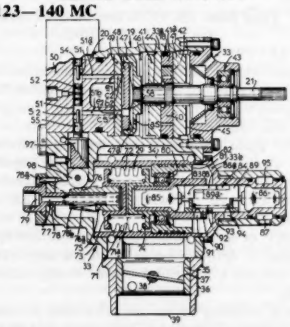


1. In a four cylinder spark-ignition internal combustion piston engine, all of the cylinders being in line, each cylinder having a main combustion chamber and an auxiliary combustion chamber connected by a torch nozzle, the combination of: walls forming exhaust passages leading from each of the main combustion chambers, respectively, on one side of the line of cylinders, intake passage means on the other side of the line of cylinders for delivering a lean mixture to each of said main combustion chambers, additional intake passage means for delivering a rich mixture to each of said auxiliary combustion chambers, said additional intake passage means including a transverse primary passage extending across the line of cylinders and symmetrically connected to two longitudinal passages of equal length on the same side of the line of cylinders as said exhaust passages, said longitudinal passages each being connected to two branch passages of equal length, each of said branch passages being connected to one of said auxiliary chambers, respectively, each longitudinal passage having a common wall with two adjacent exhaust passages, respectively, whereby the rich mixture being delivered through said additional intake passage means is heated by exhaust gases discharged from the main combustion chambers.

3,924,593
FUEL INJECTION APPARATUS FOR INTERNAL COMBUSTION ENGINES

Brian Colin Pagdin, Sutton Coldfield, England, assignor to GKN Transmissions Limited, Birmingham, England

Filed Jan. 31, 1974, Ser. No. 438,354
Claims priority, application United Kingdom, Jan. 31, 1973, 4764/73
Int. Cl.² F02D *1/04, 1/06*
U.S. Cl. 123—140 MC **2 Claims**



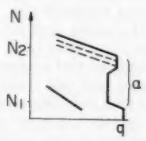
1. In fuel injection apparatus for an internal combustion engine such apparatus comprising a body affording an air inlet duct, a fuel pump means for establishing flow of fuel to an outlet means, the outlet means being connected or adapted for connection to one or more fuel injectors, metering means operative between the pump and the outlet means and adapted to be driven in timed relation with the crankshaft or other rotary output member of the engine for delivering a measured quantity of fuel to the outlet means in each cycle of operation of the engine, and sensing means for controlling operation of the metering means and sensing parameters selected to provide a proper air to fuel ratio for a range of engine loads and a range of external conditions of operation, such sensing means comprising a plurality of sensing elements each providing a mechanical output, and mechanical addition means having input elements corresponding in number to the said sensing elements, an output element, and means for algebraically adding displacements imparted to said input elements and applying the resultant to the said output element, the improvement wherein said mechanical addition means comprises:

a. sleeves movable relatively to each other lengthwise of an axis, each sleeve having an axially extending slot slidably receiving an axially extending limb of the other sleeve for coupling said elements to each other for rotation in unison about said axis
b. means for generating an increment of rotation in response to movement of each of said sleeves lengthwise of said axis
c. means for connecting one of said sleeves to said body and the other said sleeve to said metering means whereby the algebraic sum of said increments of rotation is transmitted to said metering means
d. each of said sensing elements comprising a mounting part and a output part movable relatively to the mounting part lengthwise of said axis with said output part associated operatively with a respective one of said sleeves.

3,924,594
DIESEL ENGINE FUEL INJECTION PUMP GOVERNOR

Hachiro Aoki, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed May 22, 1974, Ser. No. 472,396
Claims priority, application Japan, June 23, 1973, 48-74075[U]
Int. Cl.² F02D *1/04, 1/06*
U.S. Cl. 123—140 CC **14 Claims**



1. An engine fuel injection pump governor comprising:
a fuel injection control rod;
flyweights displaceable upon rotation thereof;
first linkage means operatively connecting said flyweights to said control rod;
governor spring means connected to said first linkage means and operable to biasingly oppose displacement of said flyweights upon rotational speed increase of the latter; and
second linkage means connected to and movable by said first linkage means, said control rod being engagable with said second linkage means during movement of said control rod in a fuel injection increasing direction to limit the movement of said control rod in accordance with a predetermined function of flyweight rotational speed, said second linkage means including a cam having a profile selected to provide said predetermined function.

3,924,595
AUTOMATIC TURN-OFF FOR TRANSISTORIZED IGNITION SYSTEMS FOR INTERNAL COMBUSTION ENGINES

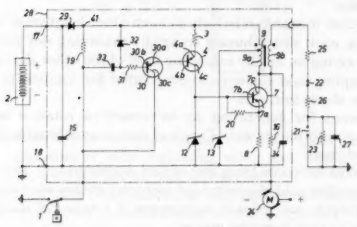
Heinrich-Josef Brungsberg, Ludenscheid, Germany, assignor to Brown, Boveri & Cie. A.G., Mannheim, Germany

Filed June 3, 1974, Ser. No. 480,541

Claims priority, application Germany, June 12, 1973, 2329918

Int. Cl.² F02P *1/00*; **H05B** *37/02*

U.S. Cl. 123—148 E **2 Claims**



1. An ignition system for internal combustion engines including

a. an ignition coil (**9**) having a primary winding (**9***a*) and a secondary winding (**9***b*);

b. a power transistor (**7**) having a current path arranged in series with said primary winding for controlling the flow of current through said primary winding;

c. a first auxiliary transistor (**4**) controlling the current flow through said power transistor (**7**);

d. an interrupter (**1**) having relatively movable contacts;

e. a second auxiliary transistor (**30**), said second auxiliary transistor (**30**) and said first auxiliary transistor (**4**) being cascade connected and said second auxiliary transistor having a current path including a capacitor (**30**) and said interrupter (**1**) arranged in series relation, whereby current flow through said second auxiliary transistor (**30**) is interrupted when said interrupter (**1**) is in the closed position thereof and said capacitor (**33**) charged;

f. a discharge circuit for said capacitor (**33**) including a first diode (**32**) for discharging said capacitor (**33**) in response to reopening of said interrupter;

g. a first resistor (**19**) arranged in series with said interrupter (**1**);

h. one end of said first resistor (**19**), the emitter (**4***a*) of said first auxiliary transistor (**4**) and the cathode of said diode (**32**) being connected to a common terminal (**17,41**);

i. the base (**4***b*) of said first auxiliary transistor (**4**) being connected to the emitter (**30***a*) of said second auxiliary transistor (**30**);

j. the base (**30***b*) of said second auxiliary transistor (**30**) being connected by the intermediary of a second resistor (**31**) and said capacitor (**33**) to the other end of said first resistor (**19**); and

k. the collector (**30***c*) of said second auxiliary transistor (**30**) being directly connected to said other end of said first resistor (**19**).

3,924,596
FAIL-SAFE THROTTLE FOR AN INTERNAL COMBUSTION ENGINE

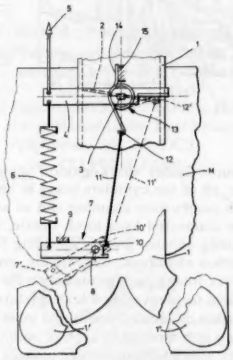
Peter Klemm, Wolfsburg, and Klaus Schulze, Hondelage, both of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Jan. 4, 1974, Ser. No. 430,777

Claims priority, application Germany, Jan. 12, 1973, 2301449

Int. Cl.² F02B *77/00*

U.S. Cl. 123—198 D **7 Claims**



1. Throttle control for internal combustion engines, particularly for an automobile having a throttle in an air intake manifold, comprising

throttle means movable between an idle position and a plurality of operating positions;

a normally operative first spring connected to said throttle means and biasing the same to said idle position;

a further spring which is normally disconnected from said throttle means; and

means for operatively connecting said further spring to said throttle means only in the event of failure of said first spring, for said further spring to bias said throttle means to said idle position thereof.

3,924,597
INTERNAL COMBUSTION ENGINE HAVING A SOUND-MUFFLING CASING

Ernst Hatz, Runstorf, and Johann Schmuck, Feilnbach, both of Germany, assignors to Motorenfabrik Hatz KG., Ruhstorf, Germany

Filed Mar. 13, 1974, Ser. No. 450,612

Int. Cl.² F02B *77/00*

U.S. Cl. 123—198 E **7 Claims**

1. In combination with an internal combustion engine having at least two mating part and fastening means for fastening said two parts together, a sound-absorbing casing completely enclosing said engine, comprising:

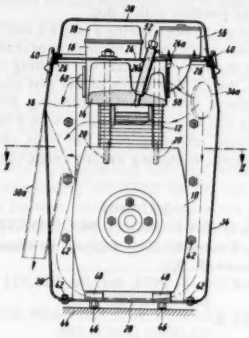
a support plate positioned and secured between said two parts when said two parts are fastened together by said fastening means, said support plate extending laterally outwardly from the walls of said internal combustion engine;

a plurality of sound-muffling plates releasably connected together to define a casing having an open side thereon, said internal combustion engine being received in said casing;

releasable securing means for releasably securing said casing adjacent the edges of said open side to said support plate; and

vibration damping material located between said support

plate and said sound-muffling plates and encircling the periphery of said open side, said casing being supported



solely by said support plate through said releasable securing means and said vibration damping material.

3,924,598

INTERNAL COMBUSTION ENGINE

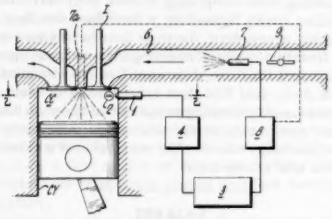
Charles W. Davis, Simsbury, Conn., assignor to Texaco Inc., New York, N.Y.

Filed Nov. 1, 1972, Ser. No. 302,692

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] F02B *19/10, 19/16*

U.S. Cl. 123—32 ST **9 Claims**



1. An apparatus for the coordinated control of the operation of an internal combustion engine with a leaner usual fuel-air mixture, i.e., a fuel to air (F/A) ratio less than 0.055 (weight basis), by variation of the mixture strength with maximum air consumption comprising a first control means comprising a pilot charge fuel control unit and including injection means for providing an intermittent timed injection of a predetermined quantity of a pilot fuel charge into the combustion chamber of a cylinder of said engine and positive ignition means, e.g. a spark plug, in said combustion chamber adjacent said injection means, intake means for providing a variable premixed fuel-air mixture leading into, said combustion chamber a second control means comprising a premixed charge fuel control unit and including a nozzle positioned in said intake means for providing fuel thereinto, a first pivoted triple linkage comprising an arm, a pinned link and a control lever in operative association with said second control means and electrical switch means actuated thereby, a second triple linkage comprising an arm and a pair of slotted links pinned thereto in operative association with said first control means, one of said pair of slotted links being joined pivotally to said control lever of said first triple linkage, said pair of slotted links responding to the positioning of said control lever of said first triple linkage, one of said pair of slotted links of said second triple linkage being responsive to said electrical switch means.

3,924,599

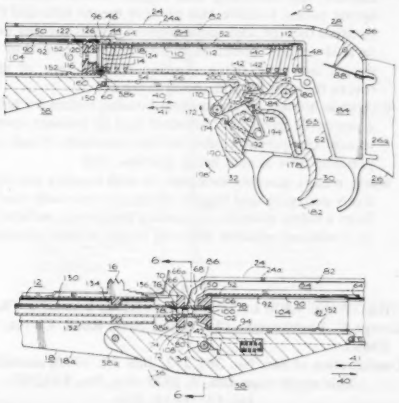
AIR GUN MECHANISM ARRANGEMENT INCLUDING TRIGGER SAFETY

William D. Hammond, San Juan Capistrano, Calif., assignor to L & R Industries, Inc., Torrance, Calif.

Division of Ser. No. 362,421, May 21, 1973. This application Oct. 21, 1974, Ser. No. 516,168

Int. Cl.[2] F41B *11/00;* **F41C** *17/02*

U.S. Cl. 124—15 **7 Claims**



1. An air operated gun mechanism comprising, in combination:

a housing;

a compression tube means slidably mounted in said housing for reciprocating motion between a firing position and a retracted position, and having a forward end having first walls defining an air passage aperture;

a plunger means slidably mounted in said housing for reciprocating motion between a firing position and a retracted position, and said plunger means having a forward position slidably mounted in said compression tube means and having a predetermined frictional force therebetween, and said forward portion adjacent said forward end of said compression tube means for the condition of said plunger means and said compression tune means in said firing position thereof, and said compression tube means free of air passageways communicating with regions extenal thereof other than said air passage aperture intermediate said forward end of said compression tube means and said forward end of said plunger means;

cocking means movably mounted in said housing for moving said plunger means from said firing position to said retracted position by movement of said cocking means in a first direction, and said predetermined frictional force between said plunger means and said compression tube means being of such magnitude that when said plunger means is moved by said cocking means from said firing position of said plunger means to said retracted position thereof, said friction force moves said compression tube means from said firing position thereof to said retracted position thereof with said compression tube means free of engagement with said cocking means for said movement between said firing position of said compression tube means and said retracted position thereof, and said cocking means moving said compression tube means from said retracted position to said firing position by movement of

said cocking means in a second direction opposite said first direction;

spring means for resiliently resisting movement of said plunger means from said firing position to said retracted position, and said spring means in a compressed condition for the condition of said plunger means in said retracted position, and said spring means extendable to an extended position to drive said plunger means from said retracted position to said firing position;

trigger means manually actuable for releasably holding said plunger means in said retracted position thereof to releasably hold said spring means in said compressed condition thereof, and actuating said trigger means releases said spring means to drive said plunger means into said firing position thereof, and said movment of said cocking means in said second direction moves said compression tube means into said firing position thereof free of spring forces thereon by said spring means;

projectile holding means on said housing means for holding a projectile to be fired adjacent said air passage aperture to said compression tube for the condition of said compression tube in said firing position, and

safety means movably mounted on said housing and operatively engaging said trigger means and manually movable from a safety position preventing trigger means actuation to a released position allowing trigger means actuation.

3,924,600

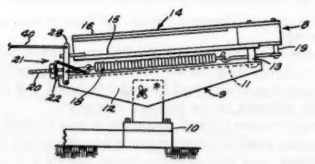
THROWING ARM LATCH FOR SPRING TARGET TRAPS

Geroge C. Luebkeman, 115 Mount Nebo Road, Cleves, Ohio 45002

Continuation of Ser. No. 381,277, July 20, 1973, abandoned. This application Jan. 9, 1975, Ser. No. 539,932

Int. Cl.[2] F41B *3/04*

U.S. Cl. 124—36 **5 Claims**



1. In a latch assembly for target traps each having an elongated base including a top wall and a side wall depending from a side edge of the top wall, a target throwing arm mounted on the forward end of the base for swinging movement above said base, a contractile spring for the throwing arm positioned between the arm and the base, a latching dog extending from the rear end of the arm, a latch lever associated with the dog, and a lateral pivot means mounting the lower end of the latch lever to the rear exterior part of the base side wall for oscillating movement in a plane normal to the swinging movement of the arm, said assembly comprising;

a bracket mounted upon a rear part of a base's top wall of a trap supporting member and said bracket having an upstanding back wall,

mounting means on the lower end of the back wall connecting the bracket to the rear end of base's top wall of a trap supporting member,

a downwardly and forwardly inclined wall having a lateral portion overhanging a side wall of a base of a trap supporting member and connected to the upper portion of the back wall, and flange means connecting the front portion of the back wall to the top wall of a base of a trap supporting member,

a narrow, longitudinally extending slot formed in the lateral portion of the inclined wall, a latch lever projecting vertically through the slot and having a foreshortened upper end associated with a dog on a throwing arm,

a spring disposed within the bracket biasing the latch lever into latching position with a dog,

said forward end of the slot forming a stop for said lever in said latching position, and latch trip means connected to the free end of the lever, the rear end of said slot forming a stop for the trip means, the lateral side edges of the slot supporting the lever against lateral stress when a throwing arm is moved towards latching and into cocked positions on a base of a trap supporting member and supporting the lever against lateral stress when the lever is moving toward unlatched condition.

3,924,601

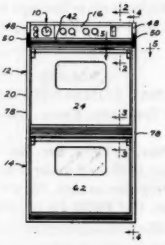
WALL OVEN EXHAUST DUCT SYSTEM

James J. Nuss, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Nov. 4, 1974, Ser. No. 520,721

Int. Cl.[2] F24C *15/32*

U.S. Cl. 126—21 R **10 Claims**



1. A cooking oven comprising an oven body surrounding an oven cooking cavity formed by a box-like oven liner and a front-opening access door, the oven liner having an oven vent opening, first duct means connecting the oven vent opening to an area adjacent the front of the oven body at a location above the access door, said first duct means being connected to a second duct means extending to the side of the oven body, and an exhaust port means at the side of the oven body with a frontward discharge whereby the oven exhaust is substantially clear of the said access door.

3,924,602

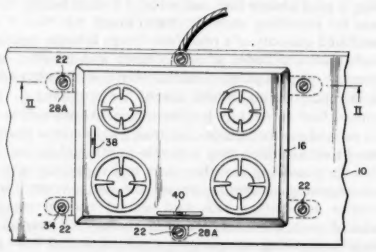
STOVE TOP WITH LEVELING MEANS

Fred Irwin, Sunnyvale, Calif., assignor to Raymond Lee Organization Inc., a part interest

Filed Aug. 26, 1974, Ser. No. 500,337

Int. Cl.[2] F24C *15/00*

U.S. Cl. 126—214 A **5 Claims**



1. Stove apparatus adapted to be installed in a horizontal counter top opening having two oppositely disposed sides, the counter top edges defining said sides each having at least one vertical bore, said apparatus comprising:

first and second horizontal members spaced below the counter top underneath the bores;

means secured to said members and to said top to hold the members in position;

a stove having a top overlying the counter top and fitting slidably within the opening;

L-shaped bracket means secured to said stove and having horizontal portions extending between bores and members, each portion having a threaded nut aligned with and disposed below the corresponding bore; and

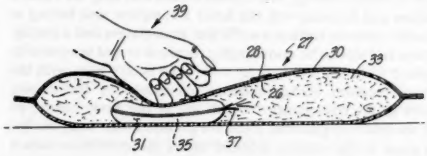
manually rotatable threaded bolts, each bolt extending through the corresponding bore and threadedly engaging the corresponding threaded nut in the corresponding bracket portion, each bolt having a top end accessable from the top of the counter and having a bottom end bearing against the corresponding member.

3,924,603

FLAMELESS HEAT SOURCE FOR USE THEREIN FOR SPLICING CABLES

Nancy L. Chapin, San Diego, Calif., assignor to Kay Laboratories, Inc., San Diego, Calif.

Filed June 17, 1974, Ser. No. 480,022
Int. Cl.² F24J *1/04*
U.S. Cl. 126—263 **27 Claims**



1. A portable heat source, including:

a first container;

a second container disposed in the first container;

first chemical means disposed in a particular one of the first and second containers;

second chemical means disposed in the other one of the first and second containers and having properties for entering at least a first reaction with the first chemical means to produce a first quality of heat and thereby elevate the temperature of the heat source to a first particular temperature;

third chemical means disposed in the other one of the first and second containers and having properties for entering at least a second reaction with the first chemical means in the first container to generate a second quantity of heat and thereby elevate the temperature of the heat source to a second particular temperature, the second and third chemical means having properties of activating each other to produce a greater amount of heat than the sum of the first and second quantities of heat when combined chemically with the first chemical means and thereby generate a third temperature higher than the first and second particular temperatures;

the second container having properties for being ruptured to permit the mixing and reacting of the first chemical with the second and third chemicals to produce heat and thereby elevate the temperature of the heat source.

3,924,604

SOLAR ENERGY CONVERSION SYSTEM

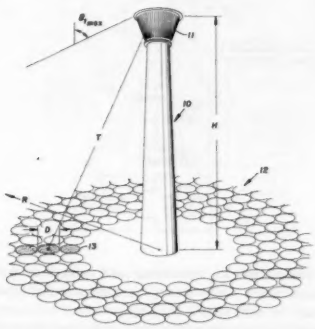
Donald E. Anderson, Northfield, Minn., assignor to G. T. Schjeldahl Company, Northfield, Minn.

Filed May 31, 1974, Ser. No. 475,164
Int. Cl.² F24J *3/02*
U.S. Cl. 126—270 **9 Claims**

1. Solar energy concentrator means, comprising in combination:

a. a centrally disposed column means having solar receiver means arranged at an elevated disposition thereon and having means defining a central system axis, pivotally mounted support pads, each pad supportably retaining an array of solar reflective elements, with each of said pivotally mounted support pads being disposed about said column and spaced outwardly from said central system axis;

b. means supportably mounting said support pads for axial rotation about the central axis thereof, and first drive means for controllably rotating each of said pads about the central axis of each of said pads;



c. said solar reflective elements being mounted upon said support pads for pivotal arcuate rotation of said reflective elements about a generally horizontal support axis;

d. said solar reflective elements having at least one surface reflective to solar radiation, with said reflective surface being mounted upon support frame means, second drive means providing rotational movement of a plurality of said support frame means about said generally horizontal support axis;

e. said second drive means positioning said support frame means to provide substantially concurrent reflection of incident solar radiation from each individual solar reflective surface on each of said support frame means onto said solar receiver means.

3,924,605

EMISSION CONTROL METHOD AND APPARATUS FOR SMOKESTACKS OR OTHER WASTE GAS DISCHARGE STACKS

James A. Weinman, and Charles R. Stearns, both of 1225 W. Dayton St., Madison, Wis. 53576

Filed Dec. 2, 1971, Ser. No. 204,161
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² F23J *11/12*
U.S. Cl. 126—307 A **19 Claims**

1. A method of controlling the waste emissions from a waste gas discharge stack,

comprising the steps of measuring downwardly directed wind components in the neighborhood of the top of the stack,

and closing the stack to prevent the discharge of waste emissions therefrom when a downward wind component exceeding a predetermined magnitude is measured,

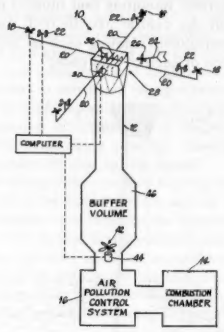
the stack being opened in the absence of a downward wind component, exceeding said predetermined magnitude,

the stack being kept open in the absence of a downward wind component exceeding said predetermined magnitude regardless of the presence or absence of horizontal wind components in the neighborhood of the top of the stack.

6. Apparatus for controlling waste emissions from a waste gas discharge stack

comprising valve means for selectively closing the stack to prevent the discharge of waste emissions therefrom,

vertical wind sensor means for detecting a downward vertical wind component in the vicinity of the stack,



and control means for operating said valve means to close the stack when a downward vertical wind component is detected by said sensor means,

said control means comprising means for causing said valve means to open the stack in the absence of such downward vertical wind component regardless of the presence or absence of a horizontal wind component in the vicinity of the stack.

3,924,606

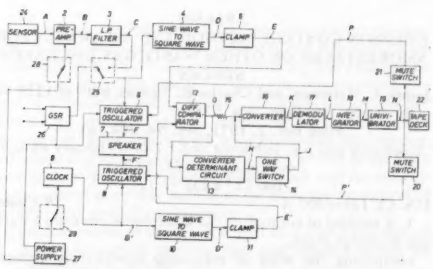
SYSTEM AND METHOD FOR MONITORING PHYSIOLOGICAL PARAMETERS

José R. Silva, and John M. Narrace, both of Laredo, Tex., assignors to José R. Silva, Laredo, Tex.

Continuation-in-part of Ser. No. 334,743, Feb. 22, 1973, Pat. No. 3,875,930. This application Nov. 23, 1973, Ser. No. 418,400

Int. Cl.² A61B 5/04

U.S. Cl. 128—2.1 B **9 Claims**



1. A system for monitoring a variable human physiological parameter and the like, comprising

detection means for deriving an electrical signal representative of a parameter sought to be monitored,

voltage means for deriving from said signal a voltage having an amplitude functionally related to a characteristic of said parameter sought to be monitored,

a tone signal generator for providing a sequence of discrete increments of tone signal each having a duration and rate of occurrence functionally related to the amplitude of said voltage, and

audio means responsive to said increments of tone signal.

3,924,607

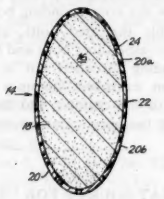
DEVICE FOR TESTING FOR THE PRESENCE OF MICRO-ORGANISMS

Louis Bucalo, 155 Roberts St., Holbrook, N.Y.

Division of Ser. No. 329,862, Feb. 5, 1973, Pat. No. 3,842,166. This application Aug. 23, 1974, Ser. No. 499,926

Int. Cl.² A61B 10/00

U.S. Cl. 128—2 W **8 Claims**



1. A device to test for the presence of micro-organisms, comprising a culture medium for promoting the growth of micro-organisms which may be present in a body cavity such as the mouth, the nose, a sinus passage, the ear, the anal canal, the vagina, the urethra, the uterus, etc., of the type encountered in human beings, and carrier means carrying the culture medium and forming with the latter a complete unit having at its entire exterior surface a sufficient smoothness and a configuration and size to be comfortably received in and temporarily retained and enclosed entirely within the body cavity with the culture medium being rendered accessible by the carrier means to micro-organisms which are in the body cavity, so that the micro-organisms, if the are present in the body cavity, can grow in the culture medium under the conditions which prevail in the body cavity.

3,924,608

ENDOSCOPE

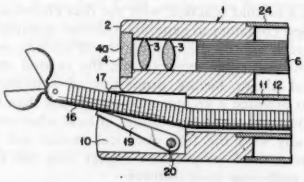
Kazuhiko Mitsui, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 22, 1974, Ser. No. 472,343

Claims priority, application Japan, May 23, 1973, 48-60530[U]; May 23, 1973, 48-60531[U]; May 23, 1973, 48-60532[U]

Int. Cl.² A61B 1/06

U.S. Cl. 128—2 B **6 Claims**



1. An endoscope to be inserted in the human body cavity including a distal end section having an outer surface provided with a view window, a control unit provided at the proximal end, and a flexible tube connecting said distal end section to said control unit, said endoscope further comprising:

port means formed in said distal end section so as to open at the outer surface, including a main suction port, and adapted to receive liquid substance from the body cavity under suction;

channel means including a forceps channel communicating with the main suction port of said port means and adapted to let the liquid substance pass therethrough from said port means; and

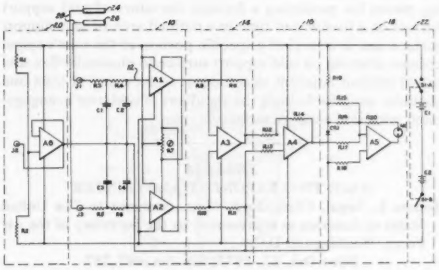
a valve member disposed in the main suction port of said port means and made movable between an open position in which the opening area of the main suction port is fully open and a restricting position where it restricts the opening area of the main suction port, said valve member being positioned relative to said view window and said suction port such that when the valve member is moved to the restricting position, the direction of flow of the liquid substance being taken into said port means under suction is changed to one substantially parallel to said view window and the flow of the liquid substance is accelerated thereby removing the liquid substance deposited on the view window.

3,924,609

DETECTOR DEVICE AND PROCESS FOR DETECTING OVULATION

Robert Friedenberg, 8792 Oxwell Lane, Laurel, Md. 20810; William Reese, Sterling, Va. 22170, and William H. Reading, III, 3432 Brookwood Drive, Fairfax, Va. 22003

Filed July 2, 1974, Ser. No. 485,262
Int. Cl.² A61B *5/05*
U.S. Cl. 128—2.1 R **15 Claims**



1. Method for determing the phase of an ovulation cycle in an adult mammalian female comprising applying conductive contacts each to a widely separated area of the body of the test individual remote from the ovulation site, measuring and visibly indicating the D.C. potential developed between the conductive contacts by a test circuit having a high input impedance and a high common mode rejection in which interfering potentials developed both within and without the test body have been removed, and identifying the phase of ovulation of the female corresponding to the measured D.C. potential.

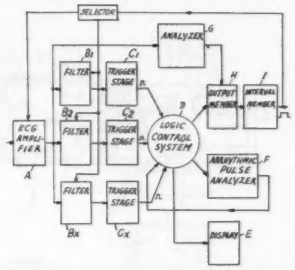
5. In a low D.C. potential measuring device for low voltage, for measurement and identifying phases of the ovulation cycle in adult female mammals measured at a point remote from the ovulation site, the combination of means for conductively contacting separate body portions remote from the ovulation site, means for measuring the potential developed between said contacting means which corresponds to the ovulation potential, and means for indicating said potential output, said measuring means including a high input impedance means and a high common mode rejection means for excluding and reducing interfering external and extraneous body generated potentials.

3,924,610

APPARATUS FOR THE RECOGNITION OF THE INITIATON OF HEART BEAT, FROM AN ELECTROCARDIOGRAM UNDER EXTREME CONDITIONS

Herwig Thoma, 40/5, Maroltingergasse, Vienna, Austria

Filed Jan. 21, 1974, Ser. No. 435,385
Claims priority, application Austria, Jan. 31, 1973, 852/73
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.06 R **10 Claims**



1. Apparatus for the recognition of the initiation of heart beat from an electrocardiograph under extreme conditions, said apparatus comprising:

a. at least one relatively wide-band conventionally controlled electrocardiographic amplifier connected to the output of the electrocardiograph and having a voltage output,

b. a plurality of filter means covering a frequency spectrum and being electrically connected in parallel to the voltage output of the amplifier for filtering the entire output range of the electrocardiograph,

c. each filter means having a respective voltage output,

d. a plurality of trigger means wherein each trigger means is electrically connected to the voltage output of a respective filter means and is responsive to the pulse produced at said voltage output,

e. each said trigger means having an output for transmitting trigger pulses,

f. a logic control means electrically connected to all the pulse-transmitting outputs of said plurality of trigger means for receiving all said trigger pulses,

g. said logic control means having an output for transmitting that trigger pulse from all the trigger pulses received, that is optimal for the recognition of cardiac activity, and

h. means electrically connected to said output of the logic control means for displaying the initiation of the heart beat.

3,924,611

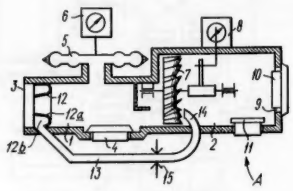
SPIROMETER AND ANENOMETER APPARATUS

Jury Petrovich Galitsky, ulitsa Kirova 13, kv. 31, Moscow, U.S.S.R.

Continuation of Ser. No. 348,627, April 6, 1973, abandoned. This application May 10, 1974, Ser. No. 469,028
Int. Cl.² A61B *5/08*
U.S. Cl. 128—2.08 **4 Claims**

1. A spirometer and anenometer apparatus comprising wall means providing a first chamber for measuring the respiratory rate; said first chamber having an inlet opening in its wall means and an opening providing communication between the first chamber and the atmosphere; an inspiratory valve accommodated in said opening providing communication between said first chamber and the atmosphere; an aneroid respiratory rate meter in movable connection with said first chamber; a registering instrument in movable connection with said aneroid respiratory rate meter; wall means providinig a second

chamber for measuring the volume of consumed air; means providing communication between said first and second chambers; said second chamber having an outlet opening in its wall means and an opening providing communication between said second chamber and the atmosphere; an expiratory valve mounted in said outlet opening; a second inspiratory valve mounted in said opening providing communication between said second chamber and the atmosphere; a rotatable impeller mounted in said second chamber so that it faces said means providing communication between said first and second chambers and rotated by an air jet flowing from said chamber



to said second chamber through said means providing communication between said first and second chambers; a second registering instrument in movable connection with said impeller to register circular motions of said impeller during exhalation; means mounted in said inlet opening of said first chamber, said means including a central opening for admitting a portion of the air coming to said inlet opening into said first chamber and a duct surrounding said central opening; and a draw-off pipe having first and second ends; said first end being connected with said duct and said second end turned to said impeller so that the air jet passing from said second end exerts a damping action upon said impeller.

3,924,612

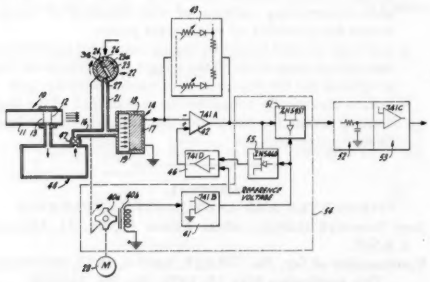
SPIROMETER APPARATUS AND METHOD

Philip T. Dempster, 322 Key Blvd., Richmond, Calif. 94805, and John Y. Pun, 1344 S. 49th St., Richmond, Calif. 94804

Filed Jan. 28, 1974, Ser. No. 437,147

Int. Cl.[2] A61B 5/08

U.S. Cl. 128—2.08 **9 Claims**



1. In a spirometer, a pneumotach, and pressure transducer connected to said pneumotach for developing an electrical signal in response to pressure changes, chopper means connected in parallel between said input to said transducer and atmospheric pressure to thereby alternately open and close the transducer input between a position reference to atmosphere and a position referenced to the pressure received from said pneumotach, means for continuously operating said chopper means between the open and closed positions, means for amplifying the electrical signals received from said transducer, and circuit means for sensing the position of said chopper means and for synchronously driving said amplifying means to a reference base line whenever said chopper means is opened to reference atmospheric pressure.

3,924,613

SEAT, PARTICULARLY FOR MOTOR VEHICLES

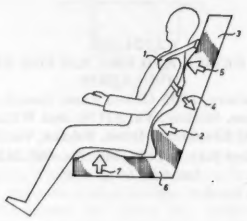
Armin Beck, Sudetenstrasse 11, 8080 Furstenfeldbruck, Germany

Filed July 25, 1974, Ser. No. 491,691

Claims priority, application Germany, Aug. 1, 1973, 2339069; Aug. 26, 1974, 2420446

Int. Cl.[2] A61H 1/00

U.S. Cl. 128—24 R **18 Claims**



1. In a seat comprising at least one support surface having a surface facing a user of said seat, the improvement comprising means for producing a forward curvature of said support surface as a function of time in a defined area of said support surface and at a level of a specific portion of the user's spinal column abutting on said support surface to physically flex said spinal column adjacent said support surface and at least one shoulder strap for holding the shoulders of said user in engagement with said support surface.

3,924,614

BASE TWO EXPONENTIAL COUNTER

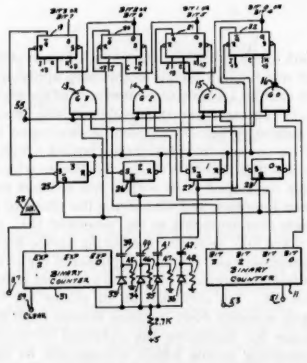
Joshua L. Segal, Chelmsford, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 17, 1973, Ser. No. 407,357

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] H03K 21/18

U.S. Cl. 328—51 **1 Claim**



1. A base two exponential counting circuit comprising:

a. a first plurality of flip-flops, each having set and reset input terminals and a complement terminal;

b. a plurality of AND gates having the outputs thereof connected one each to the set terminals of the plurality

of flip-flops, the plurality of AND gates each having a terminal for applying strobe pulses thereto;

c. a second plurality of flip-flops activated by one each of the first plurality of flip-flops, the outputs of the second plurality of flip-flops being connected to one each of the plurality of AND gates for inhibiting said gates;

d. a first binary counter having a plurality of bit outputs, one bit each connected to one of the plurality of AND gates;

e. a plurality of capacitors connected to one each of the outputs of the second plurality of flip-flops;

f. a plurality of steering diodes having one terminal connected to one each of the plurality of capacitors;

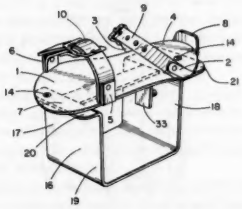
g. a plurality of grounded resistors interposed one each between the plurality of capacitors and the plurality of steering diodes; and

h. a second binary counter having an input terminal connected to the plurality of steering diodes, the outputs of the second binary counter representing an exponent count.

3,924,615
CORRECTIVE DEVICE FOR CLUBFOOT

Elvin McKim, 1821 Robert St., Wilmington, Ill. 60481

Filed Nov. 1, 1974, Ser. No. 519,839
Int. Cl.² A61F *3/00*
U.S. Cl. 128—80 J **5 Claims**

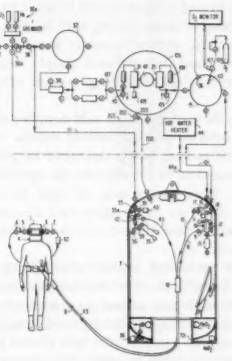


1. A corrective device for clubfoot, including a sole plate having a peripheral configuration which conforms to that of a human foot, rigid centering means to hold said foot firmly in place on said sole plate, corrective positioning means to adjust said sole plate laterally to a desired corrective position with respect to a fixed longitudinal orientation, permanently securable means to retain said sole plate in said corrective position, and releasable attachment means to releasably retain said corrective positioning means in a desired fixed longitudinal orientation, said sole plate being made of strong metal and said rigid centering means comprising upwardly extending bearing surface means along opposite portions of the side edges of said sole plate, wherein said upwardly extending bearing surface means comprises a first pair of upwardly and forwardly extending metal arms integrally formed with said sole plate at a location rearward thereof and on opposite sides, said first pair of arms forming an acute angle with said sole plate facing forwardly and being parallel with each other, and a second pair of upwardly extending metal arms integrally formed with said sole plate at a location forward thereof and on opposite sides, said second pair of arms being parallel with each other.

3,924,616
CLOSED CIRCUIT, FREE-FLOW, UNDERWATER BREATHING SYSTEM

Mark P. Banjavich, New Orleans, and Anthony V. Gaudiano, Metairie, both of La., assignors to Taylor Diving & Salvage Co., Inc., Belle Chasse, La.

Division of Ser. No. 198,105, Nov. 12, 1971, Pat. No. 3,802,427. This application Dec. 28, 1973, Ser. No. 429,044
Int. Cl.² A62B *7/02*
U.S. Cl. 128—142.3 **6 Claims**



4. Apparatus for conducting underwater diving operations from a vessel means operable to be buoyantly supported upon a body of water, said apparatus comprising:

floating vessel means;

underwater enclosure means operable to permit diver ingress and egress;

helmet means operable to provide a breathable atmosphere for a diver at a submerged location;

flexible conduit means extending through said underwater enclosure means between said vessel means and said helmet means and including supply conduit means and return conduit means;

means for continuously circulating a flow of breathable gas through said supply conduit means to the interior of said helmet means and from the interior of said helmet means back through said return conduit means;

return tank means carried by said vessel means remote from said diver and being connected to said return conduit means for receiving gas from said helmet means;

supply tank means carried by said vessel means remote from said diver and being connected to said supply conduit means for delivering gas thereto;

means for transmitting gas from said return tank means to said supply tank means, and including compressor means operable to pressurize gas in said supply tank means to a relatively higher pressure level than gas in said return tank means and depressor means operable to provide a relatively lower pressure level of gas in said return tank means;

said relatively higher pressure in said supply tank means being operable to induce and sustain a continuous flow of gas from said supply tank means through said supply conduit means to the interior of said helmet means;

means operable independent of diver breathing effort to regulate the rate of continuous flow of gas from said supply conduit means through the interior of said helmet means and into said return conduit means, including

flow throttling means, located generally adjacent said helmet means, and operable to continuously pass said continuous flow therethrough.

said continuous flow of gas being operable to pass continuously through said helmet means, with said continuous flow of gas circulating continuously through said helmet means and continuously removing carbon dioxide therefrom, and

means operable to pass said continuous flow of gas from said helmet means continuously into said return conduit means including

back pressure regulator valve means located generally adjacent said helmet means and operable to maintain a back pressure on said continuous flow of gas downstream of said helmet means and maintain a positive pressure in said helmet means relative to the ambient water pressure surrounding said helmet means,

said helmet means, return conduit means, return tank means, supply tank means and supply conduit means forming essentially a closed loop system of continuously flowing gas;

said continuous flow of gas from said supply conduit means through the interior of said helmet means and into said return conduit means being operable to provide a free and continuous flow of breathable gas operable to generally displace, from the vicinity of said diver's face, gas exhaled by said diver and induce said displaced exhaled gas to flow out of said helmet means and into said return conduit means;

carbon dioxide removing means, carried by said vessel means, and operable to remove carbon dioxide from gas circulating through said closed loop system;

oxygen supplying means carried by said vessel means and operable to supply oxygen into said closed loop system; sensing means operable to sense the oxygen content of oxygen in said closed loop system and cause said oxygen supply means to supply oxygen to said closed loop system in response to operation of said sensing means;

said oxygen supplying means and said carbon dioxide removing means being operable to concurrently remove carbon dioxide from and add oxygen to gas flowing through said closed loop system;

said supply tank means and said return tank means, each being carried by said vessel means and being relatively large storage capacity relative to said helmet means, and being operable to promote a relatively steady continuous circulation of gas through said helmet means;

heating means operable to heat said breathable gas circulated to said helmet means through said supply conduit means; and

pressure pulse reducing means comprising said supply tank means and said return tank means with said supply tank means and return tank means being interposed, respectively, between said helmet means and said compressor means and between said helmet means and said depressor means and operable to reduce the transmission to said helmet means of pulses generated by said compressor means and said depressor means.

3,924,617

ASPIRATION AND INFUSION NEEDLE

Antonio Ferro, Milan, Italy, assignor to Crinospital S.p.A., Palazzo Pignano, Italy

Filed Aug. 27, 1974, Ser. No. 500,933
Claims priority, application Italy, Sept. 28, 1973, 29490/73
Int. Cl.² A61M 5/00
U.S. Cl. 128—221 **1 Claim**

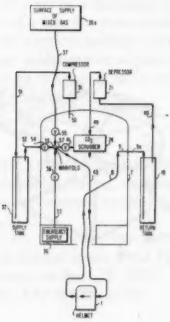
1. In a needle for use in the aspiration and infusion of solutions comprising a tubular cylindrical body and a pointed end integral therewith, said body having an axial through-bore that diverges from axiality in the region of the pointed end and terminates in an opening lying in a lateral plane and wherein the curvature of the surface of the body opposite to said opening is such that at the pointed end the body extends over the axis of the tubular body, the improvement wherein the opening and the surface surrounding the opening lie in the same lateral plane located substantially midway between and parallel to the axis of the tubular body and a plane tangent to the tubular body's outer cylindrical surface, and wherein a beveled surface is provided between the end of the surface surrounding the opening opposite from the pointed end and the tubular body's outer cylindrical surface so that the entire opening of the needle lies in the substantially lateral plane.

3,924,618

CLOSED CIRCUIT, FREE-FLOW, UNDERWATER BREATHING SYSTEM

Mark P. Banjavich, New Orleans, and Anthony V. Gaudiano, Metairie, both of La., assignors to Taylor Diving & Salvage Co., Inc., Belle Chasse, La.

Division of Ser. No. 198,105, Nov. 12, 1971, Pat. No. 3,802,427. This application Dec. 28, 1973, Ser. No. 429,045The portion of the term of this patent subsequent to Apr. 9, 1991, has been disclaimed.
Int. Cl.² A62B 7/02
U.S. Cl. 128—142.3 **8 Claims**



1. A method of conducting underwater diving operations, said method comprising:

providing underwater enclosure means operable to permit diver ingress and egress;

providing helmet means operable to provide a breathable atmosphere for a diver at a submerged location;

providing flexible conduit means extending at least between said underwater enclosure means and said

helmet means and including supply conduit means and return conduit means;

continuously circulating a flow of breathable gas from said underwater enclosure means through said supply conduit means to the interior of said helmet means and from the interior of said helmet means back through said return conduit means to said enclosure means;

causing the continuous flow of gas passing from said helmet means through said return conduit means to be transmitted to return tank means located remote from a diver wearing said helmet means;

removing gas from said return tank means by operation of depressor means, with said depressor means being operable to maintain a relatively low pressure in said return tank means to promote a continuous flow of gas from said

helmet means through said return conduit means and to said return tank means;

transmitting gas from said depressor means to compressor means at a location remote from said diver;

transmitting gas from said compressor means to supply tank means, with said compressor means being operable to pressurize gas in said supply tank means to a relatively higher pressure level;

transmitting gas from said supply tank means through said supply conduit means continuously to the interior of said helmet means, with said relatively higher pressure in said supply tank means being operable to induce and sustain a continuous flow of gas from

said supply tank means through said supply conduit means to the interior of said helmet means;

independent of diver breathing effort, regulating the rate of continuous flow of gas from said supply conduit means through the interior of said helmet means and into said return conduit means, including

passing said continuous flow of gas continuously through check valve means in said supply conduit means generally adjacent said helmet means,

passing said continuous flow of gas continuously through flow throttling means, located generally adjacent said helment means,

passing said continuous flow of gas continuously through said helmet means, with said continuous flow of gas circulating continuously through said helmet means and continuously removing carbon dioxide therefrom, and

passing said continuous flow of gas from said helmet means continuously into said return conduit means while

maintaining a back pressure on said continuous flow of gas downstream of said helmet means and maintaining a positive pressure in said helmet means relative to the ambient water pressure surrounding said helmet means, and

providing means in said return conduit means continuously operable to close said return conduit means generally adjacent said helmet means in the event of a rupture in said return conduit means remote from said helmet means;

at a location remote from said diver, providing gas recoditioning means operable to receive gas from at least one of said compressor or depressor means,

utilizing said gas reconditioning means, removing at least in part carbon dioxide therefrom, and transmitting said gas with said carbon dioxide removed at least in part therefrom to said supply tank means;

said continuous flow of gas from said supply conduit means through the interior of said helmet means and into said return conduit means being operable to provide a free and continuous flow of breathable gas operable to generally displace, from the vicinity of said diver's face, gas exhaled by said diver and induce said displaced exhaled gas to flow out of said helmet means and into said return conduit means.

3,924,619

CLOSED CIRCUIT, FREE-FLOW, UNDERWATER BREATHING SYSTEM

Mark P. Banjavich, New Orleans, and Anthony V. Gaudiano, Metairie, both of La., assignors to Taylor Diving & Salvage Co., Inc., Belle Chasse, La.

Division of Ser. No. 198,105, Nov. 12, 1971, Pat. No. 3,802,427. This application Dec. 28, 1973, Ser. No. 429,046

Int. Cl.[2] A62B 7/02

U.S. Cl. 128—142.3 **4 Claims**

3. Apparatus for controlling the temperature of breathable gas to a diver, said apparatus comprising:

a source of breathable gas remote from a submerged diver means for transmitting said breathable gas to a submerged diver;

heating means for heating said breathable gas prior to inhalation of said gas by said diver;

selectively adjustable heat transfer means adapted to be carried by said diver and connected exteriorly of said transmitting means downstream of said heating means and operable to reduce the temperature of said breathable gas;

said heat transfer means including heat transfer surface means operable to transfer heat from said gas within said transmitting means to ambient water adjacent said diver which is cooler than said heated, breathable gas; and

said heat transfer surface means included in said heat transfer means being operable in response to selective manipulation of said heat transfer means by said diver, to control the extent of reduction of the temperature of said breathable gas.

3,924,620

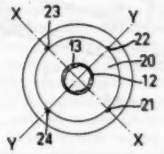
FEEDING DEVICE WITH REGULABLE FLOW

Thierry B. Seunevel, Paris, France, assignor to Alpha Bebe Sante, Zone Industrielle, France

Filed Dec. 4, 1973, Ser. No. 421,721

Int. Cl.[2] A61J 11/04

U.S. Cl. 128—252 **12 Claims**

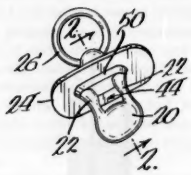


1. A feeding device, particularly for nursing infants, comprising a skirt for connection with a feeding bottle and a nipple extending from the skirt, said nipple having a substantially cylindrical wall portion with respect to an axis and an end portion, said nipple including means for regulating flow therethrough in response to changes in relative rotative position thereof with respect to the infant, wherein said regulating means includes the cylindrical wall portion of the nipple having a varying thickness about the axis, whereby varying resistances to compression of the nipple can be achieved by rotation thereof, and wherein the different thickness portions of the cylindrical wall portion is defined by diameters of different lengths, said cylindrical wall portion of the nipple having the same thickness at the two ends of each of the diameters of said cylindrical wall portion, adjacent diameters of the same length extending over a sector of said cylindrical wall portion delimiting an angle of at least 45°.

3,924,621
ORTHODONTIC DEVICE

K. A. I. Cassimally, 210 Third St. West, Roundup, Mont. 59072

Filed May 13, 1974, Ser. No. 469,422
Int. Cl.[2] A61J 11/00, 17/00
U.S. Cl. 128—252 12 Claims

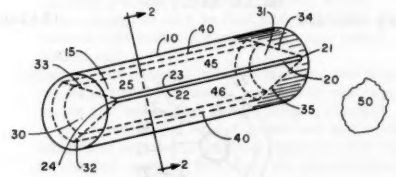


1. An orthodontic device for infants comprising:
a baglet with a connected shank for insertion into an infant's mouth up to the end of the shank,
a broad base attached to the end of the shank and having an extent greater than the shank to prevent further insertion of the device into the infant's mouth, and
the shank which is insertable into the infant's mouth comprises a plurality of connecting members for connecting the baglet to the base and defining therebetween an aperture-like space which forms means to allow a portion of the infant's tongue to move into the space.

3,924,622
ZERO-ORDER RELEASE METHOD

Dana Brooke, Evansville, Ind., assignor to Mead Johnson & Company, Evansville, Ind.

Continuation-in-part of Ser. No. 405,616, Oct. 11, 1973, Pat. No. 3,851,648. This application Nov. 26, 1974, Ser. No. 527,477
Int. Cl.[2] A61M 31/00, 7/00
U.S. Cl. 128—260 11 Claims



1. Method for the automatic release at a desired substantially constant predetermined rate R of a diffusible solid into a fluid medium into which said solid has a propensity to diffuse wherein said solid has diffusion constant (D) and solubility (C_s) with respect to said medium which comprises
1. introducing said solid into a cavity within a container, said container being impervious to said solid and said medium during the period of delivery of said solid and having a slot-like port having uniform length and width and having two ends and two sides with the narrower dimension (a) at the ends and the longer dimension (L) at the sides, said port communicating in its entirety with said cavity, said cavity being defined by a rear wall, and a pair of parallel congruent planar end walls arranged at right angles to said slot and adjacent to the ends thereof, and a pair of inwardly extending congruent planar side walls adjacent the opposite sides of said slot and in substantially divergent radial relation to said slot and extending to said rear wall, said introduction being carried out so as to completely cover the rear wall of said cavity with said solid and seal said solid to the walls thereof, and expose a single surface thereof to the slot-like port in facing relation thereto for contact with said medium, and
2. immersing said container into said medium so that the medium enters the slot and contacts said exposed surface of said solid, and
3. adjusting the dimensions (a), (L), and (Θ), wherein (Θ) is the angle subtended by the side walls of said cavity, so that said rate R is achieved and is defined by the expression

$$R = \frac{DLC_s}{\frac{h}{a} + \frac{1}{\Theta}}$$

wherein (D), (L), (C_s), (a), and (Θ) are as defined above, and (h) is the distance from the slot to the closest hypothetical point exterior of said container in said medium where the concentration of said drug is zero.

3,924,623
TIP FOR APPLICATOR SWAB

Carl Frederick Avery, Rockford, Ill., assignor to Marion Health and Safety, Inc., Rockford, Ill.

Filed Nov. 4, 1974, Ser. No. 520,467
Int. Cl.[2] A61F 13/00
U.S. Cl. 128—269 3 Claims

1. An applicator swab comprising a tube made of flexible but self-sustaining plastic and having an open end and a closed end, an ampoule filled with liquid and housed within said tube, said ampoule being frangible and releasing said liquid into said tube when the sides of the tube are squeezed inwardly to break the ampoule, and an absorbent swabbing tip telescoped into the open end of said tube and adapted to be saturated by said liquid, said tip comprising a sheet of cotton-like material whose margins are folded inwardly and stuffed into said tube to cause said sheet to define a dome adjacent the open end of the tube, and a layer of resilient foam-like material lining and contacting the inner face of said sheet and resiliently urging the folded margins of said sheet outwardly toward the inner side of said tube, the remaining portion of said layer defining a porous inner core at the central portion of said dome.

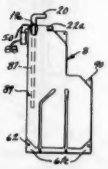
3,924,624
MODULAR THORACIC DRAINAGE DEVICE

Eli Schachet, St. Louis, Mo., assignor to Sherwood Medical Industries Inc., St. Louis, Mo.

Division of Ser. No. 386,130, Aug. 6, 1973, Pat. No. 3,847,152. This application Oct. 10, 1974, Ser. No. 513,618
Int. Cl.[2] A61M 1/00
U.S. Cl. 128—276 2 Claims

1. A drainage apparatus comprising a hollow relatively rigid plastic drainage collector chamber member having a chamber with at least one partition wall integral therewith dividing the chamber into a pair of relatively rigid vertical channels connected in fluid communication with each other above the

upper end of said partition wall, one of said channels having an initial predetermined amount of liquid to a predetermined level, an indicia mark on said chamber providing a visual indication of said level, passage means for connection in fluid communication at the upper end thereof with a body cavity to be drained, said passage means extending through an upper portion of said chamber member and into said one channel to a point below said indicia mark, vent means above the upper end of said partition wall connecting said chamber to atmosphere whereby fluid draining from the cavity flows through the passage means and enters the liquid in said one channel to fill said one channel and overflow into said second channel with gas from the cavity passing through the liquid and out through said vent means, and tube connection means above the upper end of said partition wall and the level of liquid in said collector chamber during use of the apparatus for connecting another chamber member in fluid communication with said collector chamber.



3,924,625

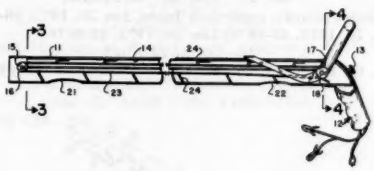
POWERED BOVINE STOMACH PUMP AND TUBE

Hans D. D. Peterson, Rte. 1 Box 28, Eagle Pass, Tex. 78852

Filed Nov. 11, 1974, Ser. No. 522,589

Int. Cl.[2] A61M *1/00*

U.S. Cl. 128—278 **6 Claims**



1. An electric motor driven bovine stomach pump and tube, said tube having an overall diameter of approximately one inch, comprising:

a. an elongated flexible outer case having an intake end and a discharge end adapted to project into the esophagus of an animal,

b. an intake opening constructed in the outer case adjacent the intake end,

c. a discharge opening constructed in the outer case adjacent the discharge end,

d. a conveyor means movably mounted internal of said outer case extending substantially the length of said outer case, said conveyor means further comprising:

1. a drive roller rotatably mounted in said outer case adjacent the said discharge opening,

2. an idle roller rotatably mounted in said outer case adjacent the said intake opening,

3. an endless flexible looped belt mounted for rotation on said drive roller and said idle roller, and

4. flexible, flared belt cups secured to said flexible looped belt, the flexible, flared belt cups being of such a configuration as to urge a fluid substance from the said intake opening to the said discharge opening,

e. a bearing means supporting said conveyor means for movement in said outer case, and

f. a drive means interconnected to said conveyor means for operably moving said conveyor means internal of said outer case operably moving the work product of said conveyor means from said intake opening to said discharge opening.

3,924,626

RECTANGULAR DISPOSABLE DIAPER HAVING A CONTOURED ABSORBENT PAD

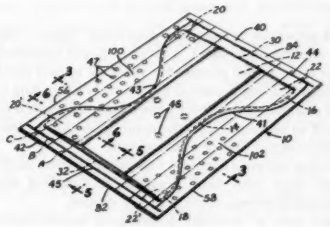
Charles A. Lee, and Frank D. Sorrells, both of Knoxville, Tenn., assignors to International Paper Company, New York, N.Y.

Filed Dec. 8, 1972, Ser. No. 313,594

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] A61F *13/16*

U.S. Cl. 128—287 **5 Claims**



1. A disposable diaper comprising in combination,

a liquid impervious backing sheet having rectangular dimensions,

a liquid pervious cover sheet, substantially coextensive in length with said backing sheet and at least as wide as said backing sheet, disposed in superposed relation to said backing sheet and covering said backing sheet to isolate said backing sheet from the skin of a person to whom the diaper is applied,

a continuous absorbent pad of generally hour-glass profile having a midsection and opposite end portions disposed between said backing sheet and said cover sheet, said pad in its end portions extending laterally substantially to the side margins of said backing sheet, whereby said pad at its ends substantially encompasses the waist of a person to whom the diaper is applied but is more narrow than said backing sheet, portions of said cover sheet overlying said backing sheet in the crotch region of said diaper and laterally of said pad midsection to define a span of diaper that is substantially free of said pad on each side of said diaper,

continuous bond line means joining said backing sheet to said cover sheet along lines disposed on opposite sides of said pad immediately adjacent to and aligned with the respective contours of said side margins, said lines being substantially coextensive in length with the longitudinal dimension of said pad and defining a substantially liquid impervious barrier against lateral migration of liquid exudate from said pad,

said diaper being folded with a plurality of longitudinal folds along each side edge thereof, said folds incorporating said spans therein whereby when said diaper is applied with said narrow midsection of said pad disposed in the crotch of said person, said spans at least partially encircle the legs of said person to securely position said diaper about said legs and maintain said pad positioned within said crotch.

3,924,627
DISPOSABLE DIAPER

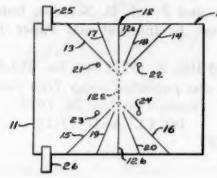
Ernst Daniel Nystrand, Green Bay, Wis., assignor to Paper Converting Machine Company, Green Bay, Wis.

Continuation-in-part of Ser. No. 373,247, June 25, 1973, abandoned. This application Jan. 28, 1974, Ser. No. 437,173

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² A61F *13/16*

U.S. Cl. 128—287 **1 Claim**



1. A generally rectangular disposable diaper comprising an outer impermeable sheet, a layer of liquid absorbing material and an inner liquid permeable sheet all united perimetrically, said diaper having a central transversely extending interrupted line of compression whereby the diaper is adapted to be folded on itself to provide a crotch-forming portion in the middle of said interrupted line of compression,

said line having a segment extending in from each longitudinal edge with each segment terminating short of the crotch-forming portion of the diaper,

a first pair of inwardly convergent foreshortened lines of compression associated with each of said segments and disposed at about 45° relative thereto, and a second pair of inwardly convergent foreshortened lines of compression associated with each of said segments and disposed at about 22½° relative thereto, each of said convergent lines of compression extending in from each longitudinal edge but terminating short of the crotch-forming portion of the diaper and short of the inner end of its associated segment and cooperating with said associated segment to provide a relatively rounded, unstressed crotch-forming portion, said diaper prior to installation on an infant being folded along said interrupted lines and having an infold along each line segment and an infold in said crotch-forming portion, and further having an infold along each first pair convergent line and an outfold along each second pair convergent line,

and means adhering said inner sheet together adjacent each longitudinal edge but spaced inwardly therefrom on opposite sides of each of said first pair of convergent lines of compression.

3,924,628
CYROGENIC BLADDER FOR NECROSING TISSUE CELLS

William Droegemueller, 30 S. Ivy, Denver, Colo. 80222; Ralph N. Eberhardt, Jr., 7323 S. Tamarac St., Englewood, Colo. 80110, and Paul E. Bingham, 236 W. Delaware Circle, Littleton, Colo. 80120

Filed Dec. 1, 1972, Ser. No. 311,069

Int. Cl.² A61B *17/36*; **A61F** *7/12*

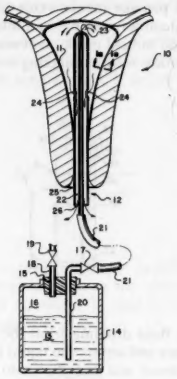
U.S. Cl. 128—303.1 **2 Claims**

1. A method of effecting coagulation necrosis of the functional uterine endometrium comprising the steps of:

a. inserting a flexible bladder in the uterus;

b. inflating said bladder with a fluid at cryogenic temperature so that said bladder is in substantially continuous contact with the inner surface of the functional uterine lining, said fluid undergoing a phase change to extract heat from said functional uterine endometrium; and

c. maintaining said bladder so inflated with said fluid at said cryogenic temperature for a period of time sufficient for



said heat extraction to effect simultaneous coagulation necrosis of substantially all of the functional uterine endometrium.

3,924,629
METHOD FOR CLOSING A CUT END OF A BLOOD VESSEL

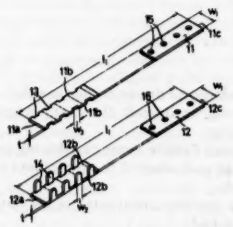
Taichiro Akiyama, 19-23, Shimoochiai 2-chome, Shinjuku, Tokyo, Japan

Division of Ser. No. 432,052, Jan. 9, 1974. This application Nov. 29, 1974, Ser. No. 528,141

Claims priority, application Japan, Jan. 20, 1973, 48-8875; Jan. 20, 1973, 48-8876; Jan. 20, 1973, 48-8878

Int. Cl.² A61B *17/12*

U.S. Cl. 128—325 **6 Claims**

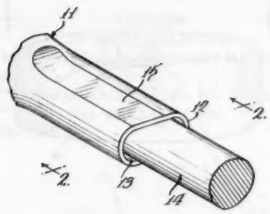


1. A method for closing a cut end of a blood vessel with a pair of closing members formed of plastic material wherein one of said closing members is rectangular with a pair of cut-out portions on opposing edges, and the other of said closing members has a similar rectangular shape with a pair of projections on opposing edges which correspond with said opposing edges of said one closing member, said method comprising the steps of nipping said cut end of the blood vessel between the pair of closing members, and fastening said pair of closing members to each other by aligning said projections with said cut-out portions, and pressing said projections over into engagement with said one closing member.

3,924,630
MANUFACTURE OF CONTROLLED RELEASE FLUID SWELLABLE SUTURES

Diann J. Walldorf, East Windsor, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Filed Nov. 18, 1974, Ser. No. 524,584
Int. Cl.² A61B 17/06
U.S. Cl. 128—339 12 Claims

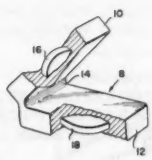


1. In a needle-suture combination comprising a needle with a sharp end and a blunt end and a fluid-swellable suture inserted at one end into a recess in said blunt end and held therein by swaging, the improvement comprising the dimensioning and configuration of said recess, said recess being provided within the swaged portion thereof with a cross-sectional area equivalent to from about 150% to about 250% of the cross-sectional area of the suture end therein when said suture is in a non-swollen state so that a suture pull-out value of from about 3 to 26 ounces is obtained.

3,924,631
MAGNETIC CLAMP

Joseph J. Mancusi, Jr., Bristol, Conn., assignor to Altair, Inc., Plymouth, Conn.

Filed Dec. 6, 1973, Ser. No. 422,315
Int. Cl.² A61B 17/00; F16K 31/08
U.S. Cl. 128—346 6 Claims

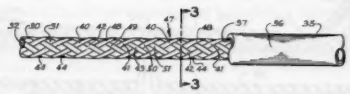


1. In combination with a clamping apparatus comprising a first jaw having a permanent magnet enclosed therein, a second jaw having a magnetically susceptible non-magnet enclosed therein, and a hinge confining the non-magnet within the operable magnetic field of the permanent magnet, the hinge and the first and second jaws being unitarily constructed of a biochemically inert material, means positioned adjacent to the second jaw having a magnetic field greater than and oriented in the opposite direction of the field of said permanent magnet for opening and closing the jaws.

3,924,632
FIBER GLASS REINFORCED CATHETER

William A. Cook, 1208 E. Wylie St., Bloomington, Ind. 47401

Continuation of Ser. No. 312,803, Dec. 7, 1972, abandoned, which is a continuation of Ser. No. 97,710, Dec. 14, 1970, abandoned. This application June 17, 1974, Ser. No. 480,004
Int. Cl.² A61M 25/00
U.S. Cl. 128—348 2 Claims

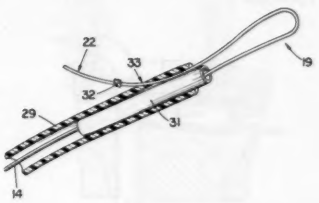


1. An intravascular catheter comprising:
a. an inner hollow and flexible plastic core having a circular cross section, an outer surface and a first length;
b. an outer flexible plastic tube having an inner surface united to said outer surface of said core along said first length;
c. and fiber glass bands spaced apart and spiralled around said core between said core and said tube; some of said bands being spiralled clockwise and some of said bands being spiralled counterclockwise around said core, said bands each comprising individual multi-filament strands of fiber glass laid in a side-by-side position, said invididual strands moving relative to one another during bending of the catheter allowing the cross section of the bands to change and thus facilitating flexibility of the catheter as well as maintaining good torsional rigidity, said outer surface of said inner core being cohesively united to said inner surface of said outer tube between said bands.

3,924,633
APPARATUS AND METHOD FOR SUPRAPUBIC CATHETERIZATION

William A. Cook, and Thomas A. Osborne, both of Bloomington, Ind., assignors to Cook Inc., Bloomington, Ind.

Filed Jan. 31, 1974, Ser. No. 438,180
Int. Cl.² A61M 25/00
U.S. Cl. 128—349 R 6 Claims

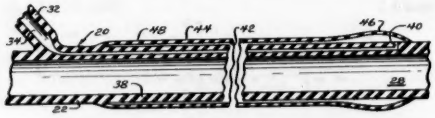


1. In a hollow flexible catheter having a proximal end and a distal end and having an opening near its distal end and having a flexible tension member secured near its distal end and passing through the opening and along within the catheter toward the proximal end, whereby when the member is drawn tight a self-retaining loop will be formed at the distal end portion of the catheter, the improvement which comprises a short tube, less flexible than the catheter, mounted within the proximal end portion of the catheter, the flexible tension member extending along within the catheter through the tube, exiting from the proximal end of the tube, passing in slideable engagement between the inner wall of the catheter and the outer wall of the tube, the wall of the catheter including an opening near the proximal end of the catheter, the flexible tension member extending from between the inner wall of the catheter and the outer wall of the tube through the opening in the catheter near the proximal end of the catheter.

3,924,634
SAFETY CATHETER AND METHOD

Glenn M. Taylor, Cary; Harish A. Patel, Crystal Lake, and Daniel M. McWhorter, Arlington Heights, all of Ill., assignors to The Kendall Company, Walpole, Mass.

Filed Sept. 11, 1974, Ser. No. 504,949
Int. Cl.[2] A61M 25/00
U.S. Cl. 128—349 B 29 Claims



1. A catheter for insertion through a body canal to a body cavity and retention therein, comprising:

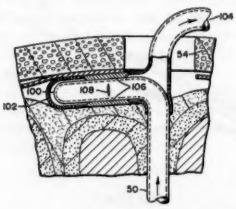
an elongated shaft having a proximal end, a distal end, and an inflation lumen; and

an elongated flexible balloon overlying the shaft and having a length approximating or greater than the length of the body canal, said balloon and shaft defining a space communicating with the inflation lumen for inflation of the balloon, said balloon having a distal end portion for placement and inflation to enlarged proportions in the body cavity relative a longitudinal portion of the balloon in the body canal, and a proximal end portion being sufficiently elastic to maintain the distal end portion inflated in its enlarged proportions when the distal end portion is located in the body cavity, and being sufficiently elastic and free to inflate outside the body canal to enlarged proportions relative the portion of the balloon in the body canal when the distal end portion is obstructed by the body canal.

3,924,635
VENTRICULAR SHUNT HAVING A VARIABLE PRESSURE VALVE

Salomon Hakim, Carrera 13, 48-26, Bogota, Colombia

Division of Ser. No. 280,451, Aug. 14, 1972, abandoned. This application June 12, 1974, Ser. No. 478,434
Int. Cl.[2] A61M 27/00
U.S. Cl. 128—350 V 1 Claim



1. A cerebrovascular shunt valve comprising a resilient valve body adapted to be inserted into the dural region, said valve body having opposed wall portions adapted to bear against the skull and the brain respectively;

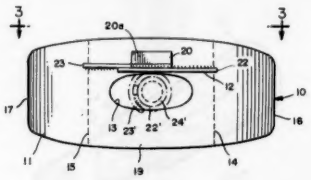
a resilient tube which extends into said valve body between said wall portions and is adapted for connection to a ventricular catheter, the end of the tube being closed within the valve body, there being a slit in the side wall of the tube within said valve body for communicating CSF from said catheter into said valve body, said slit extending in a direction normal to the direction of the longitudinal axis of the tube and positioned between said opposed wall portions thereby being oriented with respect to the wall portions of said valve body to produce opening of said slit when said wall portions are driven against said tube by pressure of the brain against the skull; and

outlet means for venting CSF from said valve body to a location outside of the skull.

3,924,636
ENDOTRACHEAL TUBE HOLDER

Benjamin Alfred Addison, 2432 Parkwood Drive, Brunswick, Ga. 31520

Filed July 5, 1974, Ser. No. 485,968
Int. Cl.[2] A61M 25/00
U.S. Cl. 128—351 4 Claims

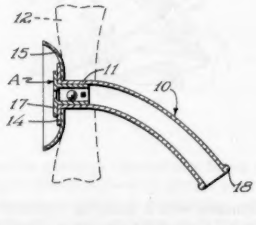


1. An endotracheal tube holder for holding an endotracheal tube in a patient's mouth during surgery comprising an adhesive-backed strip adapted to be adhesively secured over the mouth of the patient, the strip having an opening therethrough adapted to receive an endotracheal tube, and holding means mounted on the strip adjacent the opening for holding the endotracheal tube as it extends through the opening, the holding means including a strap having self-adhering ends and a strap support secured to the adhesive-backed strip adjacent the opening, the strap support having a portion extending from the strip generally parallel to the axis of the opening, the strap extending generally perpendicularly to said strap support portion and having a length sufficient to permit the strap to be wrapped around the tube with the ends of the strap means in overlapping adhering relationship whereby the strap can be wrapped around the tube in a plane extending generally perpendicularly to the axis of the opening and the tube can be held in a position generally parallel with the axis of the opening.

3,924,637
TRACHEOTOMY TUBE

Arthur H. Swanson, 619 S. Cecelia, Sioux City, Iowa 55106

Filed Dec. 23, 1974, Ser. No. 535,427
Int. Cl.[2] A61M 25/00
U.S. Cl. 128—351 1 Claim



1. A voice prosthesis for the rehabilitation of the voices of laryngecgectomees including:

a tracheotomy tube adapted for connection between the outer atmosphere and the trachea, the outer end of the tube adapted to be terminating adjacent the outer surface of the neck and open to atmosphere,

a flange on said tube adapted to engage the outer surface of the neck,

an attachment including a sleeve frictionally fitted into the outer end of the tracheotomy tube,

a flange at one end of said sleeve to limit insertion of said sleeve into said tube,

a ball within said sleeve of smaller diameter than the inner diameter of said sleeve,

a valve seat inwardly of said flange on said sleeve against which said ball may seat to prevent the outward flow of air through said tube, and

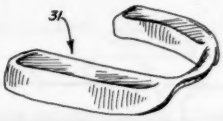
means at the inner end of said sleeve limiting inward movement of said ball within said sleeve when said ball is unseated from said seat.

3,924,638

TENSION RELIEVER

Gilbert E. Mann, 6736 Silver Mountain Road, Paradise Valley, Ariz. 85253

Filed Apr. 18, 1974, Ser. No. 461,900
Int. Cl.[2] A61J *17/00*
U.S. Cl. 128—359 **4 Claims**



1. In a tension reliever intended to be positioned in the oral cavity of the mouth of a person, said mouth presenting a lower set of teeth including incisors in the front central portion thereof, said tension reliever being intended for application to said lower set of teeth;

a. a one piece integral wall structure of a plastic that is thermosetting and at body temperature has a firm body consistency with slight properties of flexibility and elasticity;

b. said wall structure including a horizontal wall adapted to engage the teeth of said lower set;

c. an inner wall integral with and depending from said horizontal wall, said inner wall adapted to engage inner surfaces of the teeth of said lower set when the tension reliever is in effective position;

d. an outer wall integral with and depending from said horizontal wall, said outer wall adapted to engage outer surfaces of the teeth of said lower set when the tension reliever is in effective position, said outer wall being interrupted at the front central portion thereof to provide a space thereat;

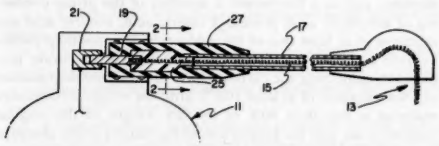
whereby said horizontal, inner and outer walls define a channel to receive the teeth of said lower set to maintain said tension reliever in effective position.

3,924,639

CARDIAC PACER LEAD SYSTEM FOR INTERIM PACING DURING PACER CHANGEOVER

Stanley R. Hess, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed July 17, 1974, Ser. No. 489,187
Int. Cl.[2] A61N *1/04*
U.S. Cl. 128—418 **5 Claims**



1. A pacer interconnection and lead system for use with an implantable cardiac pacer, which system facilitates interim pacing of a patient's heart during pacer replacement, the pacer having a connector terminal through which signals are coupled for pacing the heart of a patient, said pacer interconnection and lead system comprising:

a flexible, electrical lead;

over said lead, for a majority of its length, an insulating sheath;

at one end of said lead, an electrode adapted to contact cardiac tissue for applying stimulating pulses thereto;

at the other end of said lead, a connector adapted to engage said pacer terminal for coupling stimulating signals generated by said pacer to said electrode;

in the region of the juncture of said lead and said connector, a mass of conductive, rubbery material electrically interconnected with said lead;

an insulating rubbery jacket extending over said conductive mass from said insulating sheath;

auxiliary connection means including a needle-like conductive element insertable through said jacket to establish electrical contact with said conductive rubbery mass to permit interim pacing of a patient's heart during replacement of a pacer; and

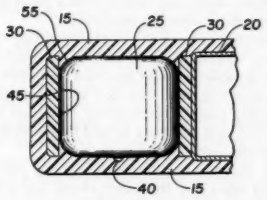
guide means for directing said needle-like element into said conductive rubbery mass without directly contacting said lead.

3,924,640

IMPLANTABLE ELECTRICALLY POWERED MEDICAL DEVICE

Wendell L. King, Isanti, Minn., assignor to Medtronic, Inc., Mpls., Minn.

Filed July 15, 1974, Ser. No. 488,524
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—419 P **3 Claims**



1. An implantable electrically powered medical device comprising: at least one generally cylindrically shaped electrochemical cell of a type which has hydrogen gas emitted during discharge thereof, an electric pulse generator including electrode members extending therefrom, a mounting member having recessed therethrough for positioning said cell and said pulse generator, an encapsulant covering the epoxy resin material positioned over the mounting member with said cell and pulse generator therein, and with the electrode members extending through the mounting member, the encapsulant covering having a thickness over the top and bottom of the cell in the mounting member from 0.040 to 0.140 inches and the radius of curvature of said cells at the top and bottom edges of the same being from greater than ⅛ inch to about ¼ inch and a mesh material positioned in the encapsulant covering over the top and bottom of the cell at at least the edges of the same.

3,924,641

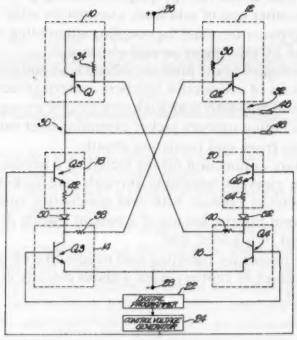
BI-PHASIC CURRENT STIMULATION SYSTEM

Gerhard T. Weiss, Northford, Conn., assignor to Axotronics Inc., Hamden, Conn.

Filed Aug. 19, 1974, Ser. No. 498,740

Int. Cl.[2] A61N *1/36*

U.S. Cl. 128—419 PG **7 Claims**



1. A bi-phasic pulse generator for producing pulses to stimulate living tissue comprising:

first and second voltage terminals having voltages of different magnitudes;

first and second conducting paths connected in parallel between said first and second voltage terminals, each of said first and second conducting paths including first and second switches connected in series, with said first switch being connected electrically closer to said first voltage terminal than said second switch and the intersections of said first and second switches in each of said paths defining output electrodes across which pulse-generator output bi-phasic pulses are produced;

interconnecting means for connecting said first switch of said first conducting path with said second switch of said second conducting path and said first switch of said second conducting path with said second switch of said first conducting path to respectively close and open said second switches in response to said first switches of opposite paths being opened and closed; and,

a driving means for alternately driving one of said first switches open and the other closed for a first predetermined time period, and vice versa for a second predetermined time period.

3,924,642

TOBACCO AND TOBACCO SUBSTITUTE MATERIAL INCLUDING METAL CHELATE COMPOUNDS

Theo Eicher; Friedemann Müller, and Klaus-Werner Krebs, all of Dormagen, Germany, assignors to Haarmann & Reimer GmbH, Holzminden, Germany

Filed Nov. 15, 1972, Ser. No. 306,655

Claims priority, application Germany, Nov. 19, 1971, 2157370; Mar. 29, 1972, 2215412

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] A24B *15/00, 15/02*

U.S. Cl. 131—2 **22 Claims**

1. In a smokable product comprising a cellulose-based combustible material, the improvement which comprises incorporating therein at least one chelate compound of the stoichiometric formula.

$$K_x[Me_yR_z]_w$$

in which

K is an alkaline earth metal or divalent manganese,

Me is trivalent iron or aluminum,

R is the radical of a chelate-forming organic carboxylic acid, and

w, *x*, *y* and *z* are integers up to about 5,

the chelate compound being incorporated in an amount ranging from about 0.5 to 70% by weight of the combustible material.

3,924,643

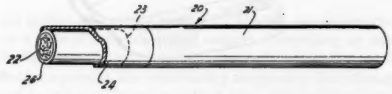
VENTILATED FILTER TIP CIGARETTE

Thomas Wade Summers, Fern Creek, N.Y., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Continuation of Ser. No. 193,124, Oct. 27, 1971, Pat. No. 3,805,800. This application Dec. 7, 1973, Ser. No. 422,930

Int. Cl.[2] A24B *15/027;* **A24D** *1/04;* **A24F** *25/00*

U.S. Cl. 131—10 A **10 Claims**



10. A ventilated filter tip cigarette comprising:

a. a tobacco column

b. a filter enclosed by a porous, air permeable wrapper, characterized by substantially uniform porosity;

c. a porous envelope characterized by substantially uniform porosity enclosing at least a portion of said enclosed filter, said envelope and wrapper being adhered together along at least one preselected region, but not over the entire area of their contiguous surfaces, the remainder of said contiguous surfaces being adhesive free, at least a portion of the remainder being air permeable to permit ambient air flow therethrough.

3,924,644

SMOKING MIXTURES

Robert Craig Anderson, and James Andrew Gibson, both of Manchester, England, assignors to Imperial Chemical Industries Limited, England

Filed Nov. 13, 1973, Ser. No. 415,427

Claims priority, application United Kingdom, Dec. 4, 1972, 55833/72

Int. Cl.[2] A24B *3/12, 15/04*

U.S. Cl. 131—17 R **7 Claims**

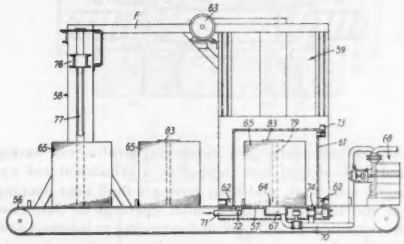
1. A smoking blend characterized generally by the flavour of flue-cured Virginia tobacco, said blend comprising a mixture of a modified carbohydrate as smoke-producing fuel, nicotine, and as a flavourant, a member of the group consisting of isovaleric acid, β-methyl valeric acid, butyric acid and mixtures of at least two of the said acids, the modified carbohydrate comprising a thermally degraded carbohydrate prepared by subjecting the carbohydrate to catalyzed degradation at a temperature of at least 100°C until the weight of degraded material is less than 90% of the dry weight of the original carbohydrate and the proportion of flavourant acids, comprising from 0.02% to 0.2 % by weight, of the smoking mixture; said mixture being blended with from 30-70% by weight thereof, flue-cured Virginia tobacco.

3,924,645

TOBACCO MOISTENING METHOD

Richard Ernest Gartside Neville, Sailsbury, and John A. Garrett, Andover, both of England, assignors to AMF Incorporated, White Plains, N.Y.

Filed May 20, 1974, Ser. No. 471,389
Claims priority, application United Kingdom, June 27, 1973, 30473/73
Int. Cl.[2] A24B *1/02, 3/02, 3/04, 3/12*
U.S. Cl. 131—140 A 8 Claims



6. A process for moistening a body of tobacco having a plurality of elongated cavities the elongated walls of which are unsupported, comprising the steps of:

coring the body of tobacco thereby forming elongated cavities before placing the body of tobacco into the chamber,

placing the body of tobacco within an enclosed chamber; and

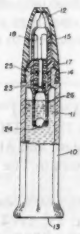
evacuating the chamber and introducing steam into the chamber while applying suction to one end of at least one of the cavities until the body of tobacco has received a sufficient quantity of moisture.

3,924,646

CUTICLE KNIFE WITH STORAGE MEANS FOR HAND LOTION

Joseph LaMura, 102 Dorsa Ave., Livingston, N.J. 07039

Filed Feb. 24, 1975, Ser. No. 552,179
Int. Cl.[2] A45D *40/00*
U.S. Cl. 132—79 R 7 Claims



1. A cuticle knife with storage means for hand lotion comprising:

a. a hollow handle closed at one end for storing hand lotion;

b. a hollow knife support of generally hollow cylindrical shape fitted into the other end of the handle for normally closing the other end;

c. a splined piston longitudinally mounted in the hollow portion of the knife support and including a conical end portion fitting into a first constricted surface of the knife support for forming a first valve, said valve adapted to be opened when the knife is depressed a small distance;

d. a knife blade secured to the outer end of the splined piston protruding therefrom for a cutting operation;

e. a resilient expansion spring also positioned within the hollow knife support engaging the inner end of the splined piston and a second constriction surface in the hollow portion of the knife holder for normally closing the first valve;

f. a second valve positioned in the hollow knife holder including a spherical ball resting against a third constriction surface in the hollow portion and adapted to cut off flow of a liquid within the hollow holder when the handle is inverted; and,

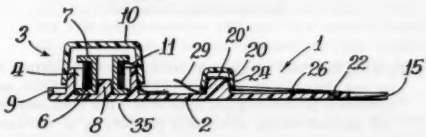
g. an axial rod secured to the inner end of the splined piston and extending to a position adjacent to the second valve for opening the second valve when the knife is depressed an additional distance.

3,924,647

DENTAL FLOSS APPLICATOR

Frederick Waldemar Lindblad, P.O. Box 1388, Aurora, Ill. 60507

Filed Feb. 28, 1974, Ser. No. 446,752
Int. Cl.[2] A61C *15/00*
U.S. Cl. 132—92 R 3 Claims



1. A dental floss applicator comprising a handle having at one end a substantially sealed chamber for receiving a supply of dental floss and at the opposite end a pair of tines extending lengthwise of the handle, the tines having means for supporting a length of dental floss across the free ends thereof, and the handle having wedge means between the chamber and said tines for holding said length of floss taught, said wedge means comprising two telescoping members having conical engaging surfaces movable into and out of telescoping engagement by movements parallel to the longitudinal axes of the conical surfaces, one of said surfacs being a substantially rigid part of the handle, and the other member having an enlarged head for facilitating pushing it onto and off said one member, the engagement of the conical surfaces constituting a limit of the extent of movement of the members into wedging position so that from that position only a reverse movement is possible, whereby the enlarged head facilitates quick release of the floss held between the tines.

3,924,648

METHOD AND MEANS FOR APPLYING ADDITIVES TO INDUSTRIAL GAS

Berwyn E. Etter, 10355 Paradise Blvd., Treasure Island, Fla. 33740

Continuation of Ser. No. 358,005, May 7, 1973, abandoned. This application Mar. 17, 1975, Ser. No. 558,945
Int. Cl.[2] C10J *1/20*
U.S. Cl. 137—3 2 Claims

2. A method for applying additives to industrial gas comprising:

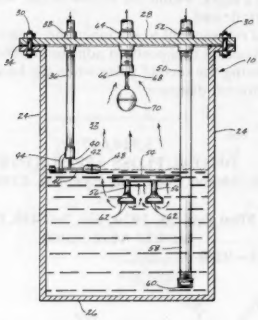
introducing a liquid additive into an enclosed container until said additive reaches a predetermined level within said container;

introducing industrial fuel gas under pressure into said container through a conduit having a first outlet below said predetermined level and a second outlet below said first outlet whereby said fuel gas will exit through at least said first outlet and percolate upwardly through said additive;

drawing off the mixture of additive and fuel gas which percolates upwardly from the upper surface of said additive,

conveying said mixture away from said container through a fluid mixture conduit;

sensing the level of additive in said container and automatically continuously replenishing said container with additive whenever the level of said additive drops below said predetermined level;



adjusting the ratio of gas and additive in said mixture by varying the pressure at which gas is introduced into said container, percolating gas outwardly from both said first and second outlets when said pressure is at increased pressure rates, and

percolating said gas outwardly from only said first outlet when said pressure is at reduced pressure rates.

3,924,649

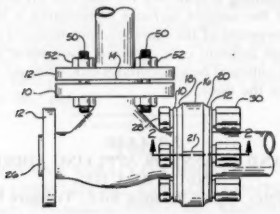
METHOD OF FLANGED JOINT SEALING

Mirrel L. Totman, McPherson, Kans., assignor to Edward L. Brown, Middletown, Ohio, a part interest

Division of Ser. No. 362,371, May 21, 1973. This application Feb. 10, 1975, Ser. No. 548,747

Int. Cl.[2] F16L *55/18*; **F17D** *3/00*

U.S. Cl. 137—15 **3 Claims**



1. A method of sealing on stream gasket leaks in a flanged pipe joint having abutting flange faces with a plurality of aligned holes in the abutting flanges with bolts in said aligned holes comprising the steps of:

sealing the outer circumferential gap between the two abutting flanges of the joint;

replacing the individual bolts one at a time in the flanged joint with a stud and two closed-end nuts each having a beveled bearing portion seated in the rim of the bolt hole; and

deforming the bolt hole rim and beveled portion by tightening said nuts to create a metal to metal seal between the nuts and rim of the bolt hole.

3,924,650

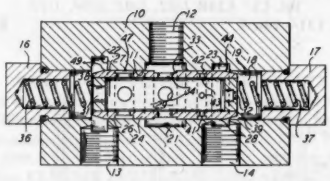
FLUID FLOW DIVIDER VALVE

Donald J. Parquet, Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed June 20, 1974, Ser. No. 481,191

Int. Cl.[2] G05D *11/02*

U.S. Cl. 137—101 **6 Claims**



1. A fluid flow divider valve comprising a valve body having a cylindrically-shaped bore defined by a cylindrical wall extending in said body, said body having a fluid inlet opening therein and having two fluid outlet openings in fluid-flow communication with said bore and extending to intersect said cylindrical wall, a one-piece cylindrically-shaped spool snugly disposed in said bore and being axially shiftable along the longitudinal axis of said bore and across said body fluid outlet openings whereby alternate axial shifting of said spool respectively alternately opens and reduces said body fluid outlet openings to the flow of fluid through said body fluid outlet openings, said body fluid outlet openings being located at axially opposite ends of said spool and within the axial extent of said spool when said spool is axially shifted toward either of said body fluid outlet openings, an end length of at least one of the axially opposite ends of said spool having its outer circumference in fluid-tight relation with said cylindrical wall which is contiguous to the respective one of the said body fluid outlet openings when said spool is axially shifted toward its said one end, said spool having a fluid passageway always in fluid-flow communication with said body fluid inlet opening and extending intermediate of said body fluid inlet opening and said one of the said body fluid outlet openings and extending to said end length on said spool and into fluid-flow communication with said one of the said body fluid outlet openings, and said spool end length having a fluid by-pass passageway therein and in fluid-flow communication with the first said fluid passageway and extending exteriorly of said spool to flow communicate with said one of said body fluid outlet openings when said spool is axially shifted toward said one of the said body fluid outlet openings and thereby by-pass fluid from said body fluid inlet opening to said one of the said body fluid outlet openings.

3,924,651

METERING OR INJECTION ELEMENT

Ludwig Jakob Hippel, Lindau, and Alex Pemsl, Hergensweiler, both of Germany, assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 365,605, May 31, 1973, abandoned. This application Oct. 15, 1974, Ser. No. 514,593

Int. Cl.[2] B29B *1/04*

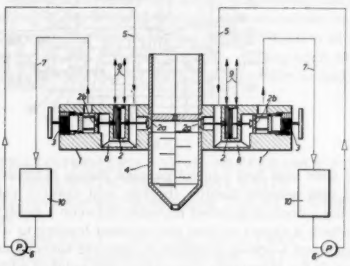
U.S. Cl. 137—115 **8 Claims**

1. In plastic molding equipment comprising a mixing chamber having at least one injection port, a reservoir for a liquid plastic component to be injected into the mixing chamber, an improved injection element to supply the component to said chamber injection port, and pump means and associated ducts connecting the injection element to said pump and reservoir to deliver the liquid component to said element and return excess to the reservoir, said improved injection element comprising:

a housing for said element having component feed, injection and return ports, said element injection port being

formed to be received in said chamber injection port, and said feed and return ports making connection with said ducts,

a pair of shiftable valve members disposed in said housing in back-to-back relation, each having a free end received in one of said injection and return ports, and control means disposed intermediate and positively interconnecting said members for reciprocal movement thereof simultaneously between opposite limiting positions in said housing; annular valve seats formed in said housing at said injection and return ports and cooperating respectively with the free ends of said shiftable valve members



to define said limiting positions, said valve seat in said housing injection port being disposed to be substantially coterminus with the injection port of the mixing chamber; said valve seats and valve members defining annular flow passages of such shape and configuration, respectively, as to provide analogous flow passages complementary to each other in all positions of said shiftable valve members between said limiting positions; and adjustment means accessible externally of said injection element housing for varying the position of said return valve seat in said housing relative to said injection valve seat to simultaneously and commonly adjust the flow cross-sectional areas of said injection and return annular flow passages.

3,924,652

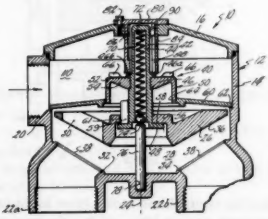
SEQUENCING VALVE

Carl L. C. Kah, Jr., 778 Lakeside Drive, North Palm Beach, Fla. 33408

Continuation of Ser. No. 398,530, Sept. 18, 1973, abandoned. This application Mar. 6, 1975, Ser. No. 555,864

Int. Cl.[2] F16K *21/00*

U.S. Cl. 137—119 **6 Claims**



1. A sequencing valve automatically responsive to the application and reduction of a pressure comprising:

A. a housing having an inlet port and a plurality of outlet ports,

B. a valve means in said housing and positioned between said inlet port and said outlet ports and shaped to sealably engage each of said housing outlet ports when in its seated position and to have at least one port therein positioned to be in register with at least one of said housing outlet ports to permit flow therethrough while blocking flow through the remainder of the housing outlet ports when in said seated position,

C. means for controlling said valve means for seating, unseating and rotational indexing motion in response to a pressure variation comprising:

1. a support member mounted for reciprocating and rotational motion within said housing for cooperation with said valve means to cause seating, unseating and rotational indexing motion of the valve member therein,

2. a pressure responsive piston member rigidly fixed to said support member,

3. a member fixedly positioned in said housing between said inlet port and said valve means and shaped to define a selectively shaped and positioned aperture therein to sealably receive said piston member as said piston member reciprocates with said support member in response to pressure variations and to cooperate with said piston member to either block flow to said valve means or to define a flow port therebetween when out of register to permit flow therethrough to said piston member,

4. cam means operatively connecting said support member and said housing and operative in response to support member reciprocation to cause said support member, said piston member, and said valve means to rotatably index to place said valve means port into register with a second housing outlet port in response to a pressure reduction and reapplication, and

D. means for connecting said valve means control means to the valve means wherein said connecting means is a lost motion connection so that said valve member may move to its seated and indexed position before said piston member comes out of register with said aperture so as to permit flow therethrough and to the said valve means, and so that said support member and said piston member rigidly fixed thereto commence motion together to unseat said valve means while said valve means remains seated so that said support member and said piston member impart a momentum force to said valve means to unseat said valve means when the lost motion is dissipated.

3,924,653

DEVICE FOR TEMPORARY STORAGE OF WASTE AND STORM WATER

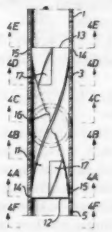
Stein Bendixen, Vatogrand 12, S-19400 Upplands Vasby, Sweden

Filed Mar. 26, 1974, Ser. No. 454,907

Claims priority, application Sweden, Mar. 27, 1973, 7304254; June 8, 1973, 7308200

Int. Cl.[2] F15D *1/00*

U.S. Cl. 137—236 **12 Claims**



1. A device for the temporary storage of waste and storm water or the like supplied into a pipe network draining an area and which can be connected to a treatment or similar plant comprising a flow regulator comprising an oblong blade-

screw-shaped body having two opposite substantially horizontally placed short sides and two opposite long sides extending in a spiral form along the inside inner surface of the pipe, said flow regulator being so arranged in a pipe that it limits an upstream space of the pipe for the temporary storage of water when the flow of water supplied exceeds a predetermined basic or normal flow of the pipe in question and having an opening permitting the passage of water through said pipe beyond said flow regulator in a flow substantially corresponding to the determined basic or normal flow.

3,924,654

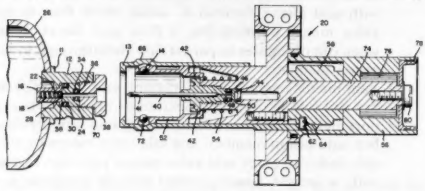
QUICK DISCONNECT TANK COUPLER

Joseph S. Buller; Arthur A. Eneim, and David A. Hitzelberger, all of Santa Barbara, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 26, 1973, Ser. No. 427,968

Int. Cl.[2] F16K *43/00*

U.S. Cl. 137—322 **5 Claims**



1. In a high pressure fluid coupling device including a high pressure tank, the combination comprising

a high pressure valve means in said tank, said valve means being normally seated by pressure in said tank;

an actuator mechanism removably connected to said tank, said actuator mechanism comprising

an outer sleeve;

means for removably securing and sealing one end of said sleeve to said tank substantially adjacent said high pressure valve means;

means within said sleeve for unseating said valve means;

cam means coupled to said sleeve at the other end thereof for axially moving said sleeve so as to provide relative movement between said sleeve and said means for unseating said valve means;

means connected to said cam for manually positioning said cam means in a plurality of preselected positions for securing said sleeve to said tank and for seating and unseating said valve means; and

an outlet passage through said actuator and said means for unseating said valve means.

3,924,655

HYDRAULIC CONTROL ARRANGEMENT

Günther Schwerin, Möglingen, Germany, assignor to Robert Bosch G.m.b.H., Germany

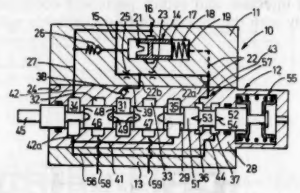
Filed Jan. 17, 1974, Ser. No. 434,343

Claims priority, application Germany, Jan. 24, 1973, 2303286

Int. Cl.[2] F15B *13/04*

U.S. Cl. 137—596.13 **7 Claims**

1. A hydraulic control arrangement comprising a fluid inlet and a fluid outlet; switch valve means communicating with said inlet and said outlet and having a valve member movable between an open position permitting flow of fluid from said inlet to said outlet through said switch valve means and a closed position preventing such flow, and spring means biasing said valve member to said closed position; first control passage means providing constant communication between said inlet and said switch valve means and connected in parallel to the latter so that fluid passing through said first control passage means acts on said valve member in the same direction as said spring means; second control passage means communicating at one end with said first control passage means; a first throttle in said first control passage means upstream of said one end of said second control passage means; a second throttle arranged in said first control passage means upstream of said first throttle and having an open crosssection which remains constant during operation; return flow passage means communicating at one end with said outlet and adapted to communicate at the other end with the other end of said second control passage means; inlet passage means communicating at one



end with said first control passage means between said first and said second throttle therein; and control valve means having a control member movable between a neutral position in which it closes at least one conduit leading to a consumer device and working positions at opposite sides of said neutral position for selectively connecting said conduit with said inlet passage means and said return flow passage means, said control member regulating also flow from said second control passage means to said return flow passage means and from said inlet passage means to said conduit.

3,924,656

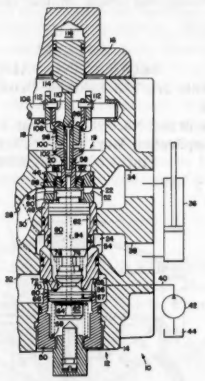
DIRECTION CONTROL VALVE HAVING FLOAT MODE

Paul Edmund Hanser, Moline, Ill., and William Lee Snyder, Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Apr. 26, 1974, Ser. No. 464,308

Int. Cl.[2] F16K *11/04*

U.S. Cl. 137—596.14 **4 Claims**



1. In a hydraulic control valve of a type including first and second identical valve assemblies, each valve assembly including a valve stem axially shiftably mounted in a valve bore means, first and second valve elements mounted on the valve stem at axially spaced locations thereof for cooperating with and controlling the flow of fluid across first and second valve seats formed by the bore means at respective locations between first and second ports thereof, respectively adapted for connection to a source of fluid pressure and a respective actuator work port, and between a third work port and a first location thereof, respectively adapted for connection to a

respective actuator work port and a reservoir; and the first, second and third ports and first location of the bore means of the first valve assembly being respectively connected to the first, third and second ports of the bore means of the second valve assembly, the improvement comprising: each of the first and second valve assemblies including first and second mounting means respectively connecting the first and second valve elements on the valve stem thereof such that axial movement of the first valve element in a first direction will unseat the first valve element and cause concurrent movement of the valve stem and unseating of the second valve element while movement of the valve stem in said first direction will leave the first valve element undisturbed while unseating the second valve element; first actuating means for selectively shifting said first valve elements of the first and second valve assemblies in said first direction; and second actuating means exclusive of said first actuating means, for simultaneously shifting each of the valve stems of the first and second valve assemblies in said first direction.

3,924,657

REMOTE-CONTROLLED VALVE, PREFERABLY FOR PNEUMATIC SAND BLAST UNITS

Soeren Kristian Assersen, Mosevangen 210, 5330 Munkebo, Denmark

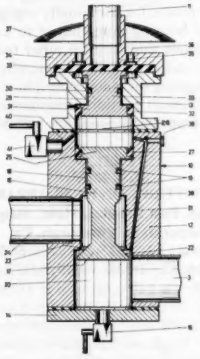
Filed Apr. 17, 1973, Ser. No. 351,883

Claims priority, application Denmark, Apr. 20, 1972, 1939/72

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² B24C *7/00*

U.S. Cl. 137—596.15 **8 Claims**



1. A valve for remotely controlling the supply of a pressure media to a receiver comprising:

a valve casing containing a control chamber vented to the atmosphere via a bore,

a cover fixed to one end of the valve casing and fixed to a pipe leading to said receiver,

a first piston and a second piston, each contained within the valve casing, each having a piston head facing the control chamber, each piston head having a surface area greater than a corresponding surface at the opposite end of each piston, the first piston opposite end positioned between a pressure entrance chamber, connected to said control chamber by a channel, and a pressure outlet chamber connected to said receiver, the second piston opposite end facing said cover and pipe, and

a flexible diaphragm positioned between said pipe and said second piston opposite end.

3,924,658

INSTALLATION TO DISPERSE GAS EFFLUENTS

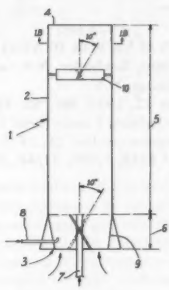
Flavien Lazarre; Jacques Rozand, both of Pau, and Simonne Roumazeilles, Lons, all of France, assignors to Societe Nationale des Petroles d'Aquitaine, Paris, France

Filed Apr. 10, 1974, Ser. No. 459,585

Claims priority, application France, Apr. 12, 1973, 73.13306

Int. Cl.² F16K *19/00*

U.S. Cl. 137—604 **15 Claims**



1. An installation to disperse gas effluent, such as hydrocarbon gases, into the atmosphere, comprising at least one dispersal appliance, which can easily be transported, said dispersal appliance comprising a mixing shaft, open at both ends, and a single high-pressure gas injector, placed along the longitudinal axis of the shaft, near one end, the ratio of the square roots of the shaft and injector nozzle section, based on the smallest cross-sectional areas of both shaft and injector, being between 50 and **300.**

3,924,659

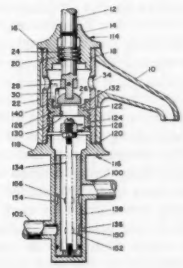
FAUCETS

Charles C. Veale, 950 Canyon View Drive, Laguna Beach, Calif. 92651

Filed June 19, 1974, Ser. No. 480,608

Int. Cl.² F16K *11/16*

U.S. Cl. 137—630.17 **13 Claims**



1. A valve for controlling both the combined flow rate and the ratio of the flow rates from two sources using a single operating element comprising in combination:

a valve body defining two separate inlet flow paths which combine to form a single outlet flow path;

first and second valves each comprising cooperating head and seat elements, one of said first and second valves being located in one of said inlet flow paths and the other of said first and second valves being located in said outlet flow path;

a valve operator moveable in each of two directions; and valve actuating means responsive to movement of said valve operator in one of said two directions for opening said first valve and, when said first valve is opened in given degree, for actuating said second valve in said one direction, said valve actuating means being further responsive to movement of said valve operator in the other of said two directions for closing said first valve and, when said first valve is closed, for actuating said second valve in an opposite direction.

3,924,660

DISTRIBUTION VALVE FOR DENTAL EQUIPMENT

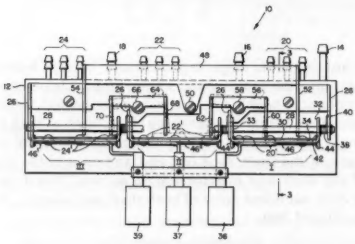
Glen Arthur Woodhams, Rochester, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

Filed June 22, 1973, Ser. No. 372,823

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] F16K *31/00, 31/44, 35/14*

U.S. Cl. 137—637.1 **4 Claims**



1. A manually operated distribution valve for selecting the simultaneous delivery of a plurality of utility services to one or another of several dental handpieces wherein operation to deliver the services to one instrument automatically terminates delivery to all other instruments, said valve comprising:

a. a manifold block having a single inlet and a plurality of outlets for each utility service, the outlets being grouped in sets so that each set has one outlet for each service;

b. each outlet being valved and having a valve operating stem extending up through said manifold block said stems being aligned along said manifold block;

c. a manually operated lever associated with each set of outlets, said lever being pivoted about an axis located above and along said valve stems;

d. an actuating rod carried by each lever, said rod being moved down and across the valve stems in one set to move the valves therein to an open position when the lever associated with that set is manually pivoted about its axis; and

e. linkage means between said sets and cooperating with said actuating rods for closing the valves in one set when the valves in another set are opened said linkage means including a plurality of levers, one located between each pair of valve sets so that opening any one set will automatically close another previously open set, each of said levers being generally U-shaped with the base of the U-shape being pivoted to said manifold block and each leg of said U-shape being adapted to engage the actuating rods of adjoining sets.

3,924,661

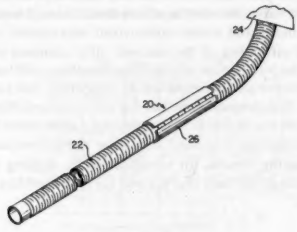
FLEXIBLE HOSE STORAGE CONTAINER

Frank G. Bornhoffer, 79 Esteban Drive, Milford, Ohio 45150

Filed July 16, 1973, Ser. No. 379,354

Int. Cl.[2] F16L *57/00*

U.S. Cl. 138—110 **3 Claims**



1. A storage container and flexible hose combination for lengths of flexible hose, said flexible hose having means for axially expanding and compressing to lengthen or shorten said hose, said container comprising an open-ended cylindrical housing of semi-rigid plastic material having an axial length substantially less than the expanded axial length of said flexible hose, said housing axial length being approximately as long as the compressed length of said flexible hose whereby substantially the entire length of compressed hose is enclosed and protected within said housing, said housing being formed with an axial separation from one end to the other thereby being radially expandable and contractable to accommodate hoses of different diameter, said axial separation forming a pair of linear edges in said housing, said housing defining an inner friction engaging surface for frictionally engaging said flexible hose therein, said housing constructed to cause said linear edges to tend to move toward each other thereby exerting a compressive force radially inwardly whereby said inner surface frictionally engages the outer pheripheral surface of said hose such that maximum frictional engagement occurs when said hose is in a compressed condition within said housing.

3,924,662

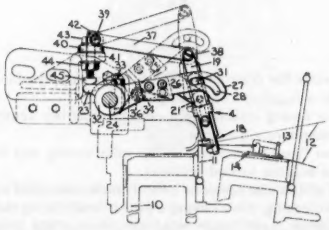
WEFT CUTTER CONTROL APPARATUS

Edward S. Budzyna, East Douglas, Mass., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Mar. 12, 1975, Ser. No. 557,500

Int. Cl.[2] D03D *49/00, 45/50*

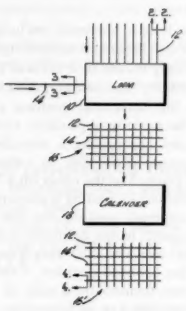
U.S. Cl. 139—302 **4 Claims**



1. In a shuttleless loom in which weft yarn is inserted into the shed formed by warp yarns from a stationary source located outside of the shed and in which after insertion the weft is beat into the fabric fell by the loom reed and then trimmed by a cutter operated by a cutter shaft, the combination comprising:

a. a cutter;
b. pivotable mounting lever connected to the cutter shaft;
c. a cutter mounting bar mounted on said pivotable mounting lever to provide a fulcrum point between the ends of said cutter mounting bar, said cutter being slidably carried in said cutter mounting bar for operative cooperation with one end of the latter in cutting the weft;
d. a cutter actuating lever operatively connected adjacent one end to said cutter with the opposite end being connected to said cutter shaft;
e. cutter bar control lever means pivotably connecting the end of said cutter mounting bar on the opposite side of the fulcrum point from the cutter cooperating end thereof to a fixed pivotal position adjacent said cutter shaft, said cutter actuating lever and said cutter bar control lever means cooperating during actuation of said cutter shaft to move said cutter between an operative position at the fabric line and an inoperative position located upwardly and forwardly of the fabric fell line so that the cutting mechanism is clear of the loom reed during beatup.

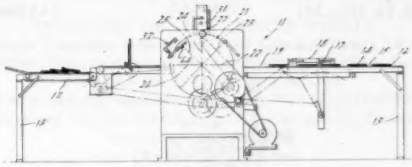
3,924,663
DRAPERY FABRICS
William Bruce Dean, Cornelia, Ga., assignor to Johnson & Johnson, New Brunswick, N.J.
Division of Ser. No. 347,934, April 4, 1973. This application May 7, 1974, Ser. No. 467,703
Int. Cl.[2] D03D *15/00*
U.S. Cl. 139—420 R **2 Claims**



1. A stablilized open-weave drapery fabric having excellent surface coverage, high color intensity and low light penetration per unit weight comprising: (1) a warp containing from about 16 to 24 ends per inch of relatively flat oval strip saran having an average thickness of from about 1½ mils to about 3 mils and an average width of from about 20 mils to about 35 mils and (2) a filling of flattened oval modacrylic yarns having a yarn size of from 8/1 to about 4/1 cotton count, said filling yarns being molded into the flattened oval cross-sectional shape in the plane of the fabric whereby there is no tendency of said filling yarns to roll, shift or move out of their positions as originally woven, there being from about 12 to about 16 picks per inch.

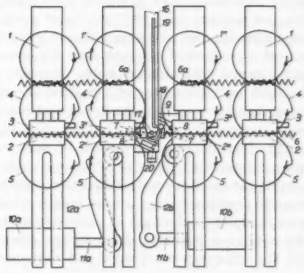
3,924,664
COIL BINDING MACHINE
Ernst Pfaffle, Neuffen-Wurttemberg, Germany, assignor to Hans Sickinger Co., Pontiac, Mich.
Filed Feb. 26, 1975, Ser. No. 553,253
Int. Cl.[2] B21F *35/02*
U.S. Cl. 140—92.7 **4 Claims**

1. In combination with an indexing type of coil binding machine having a carriage with a plurality of spaced stations, a pair of cutter assemblies at opposite ends and outwardly of one of said stations for trim-cutting and inwardly bending the ends of a spiral wire binder in an apertured stack supported by said carriage, each cutter assembly having a pair of teeth movable inwardly to partially envelop a coil turn and a blade movably mounted between said teeth for severing and bending the coil end after the cutter assembly has moved inwardly, and a pair of curved guides placed in the path of the coil ends to



be trimmed opposite said cutter assembly and so located with respect to the stack apertures in which said coil is disposed that said coil ends will engage and ride upon said guides as said carrier indexes and thereby be lifted to the outsides of said apertures, thus exposing a substantial portion of each coil to be partially enveloped by said teeth and aligned with said cutting blade for severing and bending.

3,924,665
SPRING CORE ASSEMBLY MACHINE
Walter Spühl, St. Gallen, Switzerland, assignor to Spuhl AG, St. Gallen, Switzerland
Filed Mar. 12, 1975, Ser. No. 557,669
Claims priority, application Germany, Mar. 19, 1974, 2413033
Int. Cl.[2] B21F *27/16*
U.S. Cl. 140—92.7 **9 Claims**



1. A spring core assembly machine comprising, in combination, a plurality of clamping jaw pairs arranged next to one another in a row for holding together the end coils of adjacent coil springs while said springs are connected to one another by threading through wire coils; cut-off and loop forming means for cutting off wire coils on at least one clamping jaw pair and forming the cut-off wire coils into loops, said cut-off and loop forming means being located between two adjacent clamping jaw pairs and having a pair of knives for each respective clamping jaw pairs for cutting said wire coils.

3,924,666

SUSPENDED SUCTION OR FILL PIPE FOR HANDLING FLUID PRODUCTS OR THE LIKE

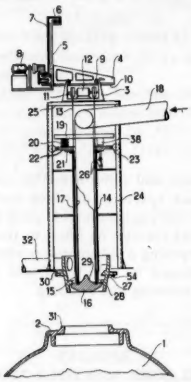
Michel Raison, Saint-Arnoult-en-Yvelines, France, assignor to Compagnie Generale d'Automatisme, France

Filed Oct. 11, 1972, Ser. No. 299,611

Claims priority, application France, Oct. 11, 1971, 71.36492

Int. Cl.[2] B65B *3/04*; B65G *11/14*

U.S. Cl. 141—231 14 Claims



1. A telescopic suction or fill pipe arrangement for conveying into a tank to be loaded or unloaded fluid products or the like at a great flow rate, the arrangement comprising: a product conducting pipe including an external pipe element and an internal pipe element slidable within said external pipe element, said internal pipe element and said external pipe element being insertable into the tank to be loaded or unloaded, said internal pipe element and said external pipe element each having upper and lower end portions, said pipe having an initial retracted position with the lower end portions of said internal pipe element and said external pipe element being in alignment and an extended position with the lower end portion of said external pipe element being disposed at the bottom of the tank and the upper end portion of said external pipe element being disposed at the lower end portion of said internal pipe, supporting means for supporting said pipe including means for effecting movement of said internal and external pipe elements together or separately with respect to said supporting means in a vertical direction, said pipe in said initial retracted position having a total length which is essentially shorter than the total length of a movement stroke of the pipe to the extended position, drive means connected with said means for effecting movement and with said pipe for selectively driving said pipe from said initial retracted position to said extended position and from said extended position to said retracted position, said drive means successively effecting first a relative movement of said external pipe element and said internal pipe element with respect to said supporting means and second a relative movement of said external pipe element with respect to said internal pipe element, said external pipe element being slidably guided on said internal pipe element for movement substantially along the entire length thereof from said intial retracted position to said extended position, and a protective and guiding cage surrounding said pipe and supported at a constant level by said supporting means including at least a pair of tracks, and guide means on said external pipe element for assuring the correct bearing of the internal element on said tracks provided on said cage.

3,924,667

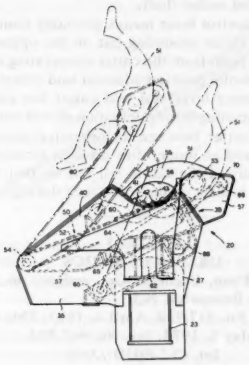
COMPACT TREE CLAMP AND AUTOMATIC SEQUENCE CONTROL FOR A TREE LENGTH HARVESTER

Ian McKenzie, Lambeth, Canada, assignor to Clark Equipment Company, Buchanan, Mich.

Filed Mar. 18, 1974, Ser. No. 452,171

Int. Cl.[2] A01G *23/08*

U.S. Cl. 144—3 D 6 Claims



1. In a mobile tree length harvester including means for cutting a standing tree and holding it upright, means for pivoting the cutter and holding means in a vertical plane to orient the tree in a substantially horizontal position, means for clamping the tree in the horizontal position and means for delimbing the tree in the horizontal position, the improvement in said clamping means comprising a movable jaw having separate pivoted elements disposable in either a raised or lowered position, one pivoted to the other on a first axis parallel to the delimber axis and extending transversely above the delimber axis in the lowered position and the other pivoted about a second axis parallel to the delimber axis on the opposite side of the delimber axis and extending transversely below the delimber axis in the lowered position, a fixed jaw having a tree receiving section formed by a pair of spaced plates between which the movable jaw is lowerable sufficiently to permit deposit of the severed tree on said tree receiving section and cylinder means operable for pivoting said movable jaw about the second axis for lifting the tree out of the tree receiving section of the fixed jaw and means operable to pivot the one element of the movable jaw about the first axis to hold the tree clamped on the tree receiving section of the fixed jaw in the lowered position of the movable jaw and to release the tree in the raised position of the movable jaw.

3,924,668

PRESSURE HEAD ASSEMBLY

Jeff Y. Cromeens, Mesquite, Tex., assignor to Industrial Woodworking Machine Co. Inc., Garland, Tex.

Filed Mar. 15, 1974, Ser. No. 451,451

Int. Cl.[2] B26D *7/06*; B27B *31/00*

U.S. Cl. 144—244 5 Claims

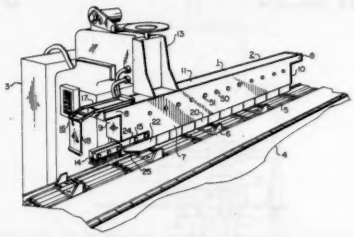
1. A pressure head assembly for holding discrete work pieces of different thicknesses, widths and lengths against displacement while permitting travel of the work pieces therebeneath including:

a pressure head elongated longitudinally of the direction of travel of the work pieces,

a multiplicity of relatively narrow elements slidably mounted in the underside of the pressure head and depending therefrom for upright reciprocation relative thereto and to one another.

pressure-responsive means in said pressure head overlying the elements for operative engagement therewith for resiliently urging said elements into engagement with the work pieces,

said elements being disposed in a plurality of contiguous rows extending longitudinally of said head with the elements of each row being staggered relative to the elements of adjacent rows whereby each portion of each element of each row overlaps portions of said elements of the other rows to provide a continuous bearing surface for the work pieces,



a plurality of means extending transversely of said pressure head for slidably suspending said elements,

each of the suspending means being common to one element of each of said rows for slidably supporting said elements independently of the other elements of the same row,

each of said elements common to the same suspending means having independent connection therewith so as to be reciprocable relative to its commonly supported elements.

3,924,669

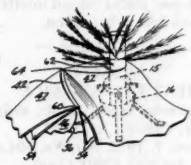
MEANS FOR DISPOSING OF CHRISTMAS TREES

Roger W. Price, Muskegon, Mich., assignor to NeeTree Corporation, Muskegon, Mich.

Filed Mar. 21, 1974, Ser. No. 453,263

Int. Cl.[2] B65D *81/00, 65/10*

U.S. Cl. 150—52 R **12 Claims**



1. A display and disposal envelope for controlling litter from a Christmas tree or the like, which tree is adapted to be supported by its trunk in a stand on a supporting surface, said envelope comprising a cylinder of a flexible membrane having sides, an open end, and a generally closed end; said envelope, when said sides are erected, having a cross-sectional area large enough to receive a tree; said closed end having a center, aperture means located at said center for receiving the trunk of the tree therethrough, and a sealed seam located at said closed end extending across the entire width of said closed end, and joining and closing said sides of said cylinder at said closed end except for said aperture means which allows a tree trunk to pass therethrough; said sealed seam including means for supporting said closed end in an upstanding, crown-like tent over a tree stand such that the remainder of said cylinder sides flair downwardly and outwardly beneath the supported tree during display to form a curved catch basin under the tree for retaining needles and other droppings from the tree, whereby when said envelope is folded into said catch basin, said envelope approximately covers the projection of the largest cross-sectional area of said tree on said supporting surface, and may be pulled up around the tree when the tree is to be removed to enclose the tree and any matter dropped from the tree during display.

3,924,670

PNEUMATIC TIRE FOR VEHICLE WHEELS

Giorgio Tangorra; Italo Bertelli, and Giovanni Calori, all of Milan, Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy

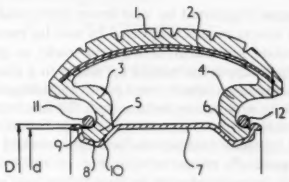
Filed May 29, 1973, Ser. No. 364,334

Claims priority, application Italy, May 31, 1972, 25140/72

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] B60C *15/02, 17/00*

U.S. Cl. 152—375 **2 Claims**



1. A pneumatic tire and wheel assembly comprising

a tire provided with a tread portion, two bead portions, and two sidewalls, the section midlines of said sidewalls having a concavity turned towards the outside,

a wheel for mounting said tire, said wheel having channel-shaped seat portions, with a supporting base and two lateral walls extending along the entire circumference of the rims of said wheel, each bead portion of said tire being seated in a corresponding seat of the rims of said wheel, and

a circumferentially extending annular element mounted on each of said rims, at least a part of the axially outermost zone of said bead portion being radially compressed between the base of said channel-shaped seat and said annular element, the radially innermost diameter of said annular element being smaller than the radially outermost diameter of the axially outer lateral walls of said seat portion of said rims, said annular element comprising at least one shaped metallic element of curcular section embedded in a shaped rubber element, the cross section of said annular element being positioned eccentrically with respect to that of said shaped rubber element, said shaped rubber element being provided with an appendix intended to be received in an appropriate groove on the radially outer surface of the bead, said groove extending along the whole circumferential development of the bead.

3,924,671

FOLDING SCREEN FOR LIGHT PERMEABLE SKYLIGHTS AND THE LIKE

Charles R. Gates, 15070 Hill Drive, Novelty, Ohio 44072

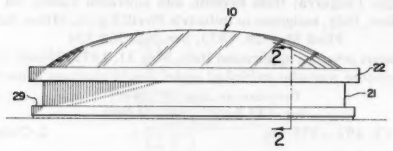
Continuation-in-part of Ser. No. 462,172, April 18, 1974, which is a continuation of Ser. No. 242,649, April 10, 1972. This application Mar. 5, 1975, Ser. No. 555,365

Int. Cl.[2] E05D *15/26*

U.S. Cl. 160—183 **4 Claims**

1. A folding radiation screen having predetermined permeability to sunlight, for operation beneath a skylight or light-permeable roof structure, said screen comprising a plurality of relatively rigid panels successively hinged together through interdigitated longitudinal edges thereof for co-action in side-

by-side relationship and supported by a pair of parallel, overhead track means inclinedly disposed at an angle less than 75° with respect to the horizontal, each said track means including a lower horizontal track and an immovable vertical guiding lip means, said panels being movable from a folded, stacked relationship adjacent one end of said track means to a generally planar relationship extending between said one end and the other end of said track means, the end panel adjacent said one end being fixedly disposed for pivotal movement about the longitudinal edge of said end panel adjacent said one end;



rolling means supported by said lower horizontal track, and, washer or spacer means supported by said lip means to coactingly translate said panels along said tracks so as to dispose hinged edges supported by said lip means in a plane vertically upwardly displaced relative to a plane including hinged edges supported by said rolling means; and, flexible means to exert a sufficient force on said panels, in either direction along said tracks, to translate said panels from said stacked relationship into said generally planar relationship, or vice versa, so as to control the intensity of said sunlight below said screen.

3,924,672

DEVICE FOR THE ELECTROSLAG CASTING OF INGOTS

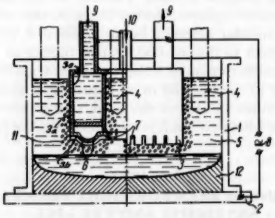
Boris Evgenievich Paton, ulitsa Kotsjubinskogo, 5, kv. 21; Boris Izrailevich Medovar, Bulvar Lesi Ukranki, 2, kv. 8; Leonty Vasilievich Chekotilo, ulitsa Scherbakovka, 49a, kv. 10; Viktor Mikhailovich Martyn, ulitsa Vernadskogo, 65a, kv. 102; Viktor Leonidovich Artamonov, ulitsa Sovskaya, 9, kv. 4; Anzor Ippolitovich Bochorishvili, ulitsa Vernadskogo, 65, kv. 102; Leonid Mikhailovich Stupak, Brest-Litovskoe shosse, 39, kv. 9; Anatoly Petrovich Sysenko, ulitsa Polevaya, 25, kv. 1, and Valery Georgievich Popov, ulitsa Ezhena Potie, kv. 72, all of Kiev, U.S.S.R.

Continuation of Ser. No. 130,412, April 1, 1971, abandoned. This application Dec. 26, 1973, Ser. No. 427,526

Claims priority, application U.S.S.R., Apr. 20, 1970, 1424449; Aug. 8, 1970, 1457823; Oct. 1, 1970, 1475936

Int. Cl.² B22D *27/02*

U.S. Cl. 164—252 **2 Claims**



1. A device for electroslag casting of ingots which comprises a mold, a bottom plate therefor, consumable electrodes, a non-consumable cooled metal electrode to be partially immersed in a melt, and an electric current source provided between the non-consumable electrode and the bottom plate, said non-consumable electrode having a a sidewall, an end wall and a bore through which a gas flow passes, the end wall and the sidewall adjacent thereto having grooves, the grooves being provided with openings in communication with the bore, with the grooves serving for guiding a flow of gas bubbles admitted from the openings over the whole surface of the partially immersed non-consumable cooled metal electrode, thus preventing it from electrochemical destruction.

3,924,673

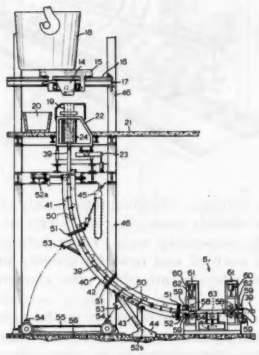
APPARATUS FOR PRODUCING CONTINUOUS METAL, CASTINGS

Tibor Miklos Vertesi, Whitby, Canada, assignor to Gamma Engineering Limited, Burlington, Canada

Filed Mar. 18, 1968, Ser. No. 713,904

Int. Cl.² B22D *11/08*

U.S. Cl. 164—274 **23 Claims**



1. In a continuous metal casting apparatus for producing a metal strand of predetermined width, an elongated articulated starting device, a plurality of guide rollers mounted on each side of the starting device at spaced intervals along substantially the entire length thereof, and a roller apron having a pair of laterally spaced tracks engageable by said guide rollers for guiding said starting member through said roller apron, the lateral spacing of said tracks being greater than said predetermined width so that said tracks do not interfere with passage of said strand through said roller apron.

3,924,674

HEAT VALVE DEVICE

Algerd Basiulis, Redondo Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 7, 1972, Ser. No. 304,421

Int. Cl.² F28D *15/00*

U.S. Cl. 165—32 **3 Claims**

1. A heat switching device having first and second states comprising:

a housing of low thermal conductivity having a first heat transfer region and a second heat transfer region, said housing containing a gas during said first state and containing a fluid during said second state;

capillary means having a void volume and disposed within said housing for conveying a fluid between said heat transfer regions during said second state;

a fluid reservoir for containing a fluid during said first state;

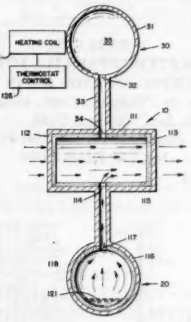
means hermetically sealing said fluid reservoir to said housing for providing fluid communication therebetween;

a volatile working fluid in said fluid reservoir during said first state and being sufficient to fill the void volume of said capillary means during said second state;

a gas reservoir;

means hermetically sealing said gas reservoir to said housing for providing fluid communication therebetween;

an inert gas being non-condensible in said first and second states being at a predetermined pressure within said gas reservoir and said housing for preventing transfer of heat between said heat transfer regions during said first state and being displaceable from said housing into said gas



reservoir by increasing the vapor pressure of said volatile working fluid above said predetermined gas pressure in said second state; and,

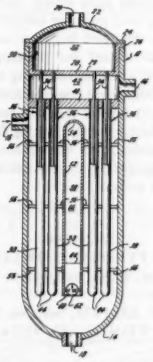
means coupled to said gas reservoir for varying the inert gas pressure therein and varying the switching point from said first state to said second state.

3,924,675

ENERGY ABSORBER FOR SODIUM-HEATED HEAT EXCHANGER

Jan Essebaggers, Succasanna, N.J., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed May 3, 1973, Ser. No. 356,879
Int. Cl. F28f *9/00*
U.S. Cl. 165—134 **4 Claims**



1. A heat exchanger comprising: an outer shell;

a liquid sodium outlet in said shell;

a liquid sodium inlet in said shell;

a plurality of tubes for carrying water, and extending within said shell between said liquid sodium inlet and said liquid sodium outlet;

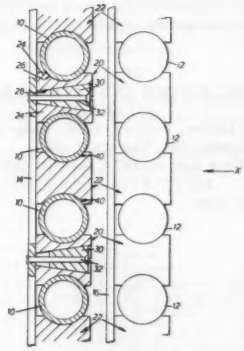
an energy absorber wholly within said outer shell having a sidewall defining chamber, a channel opening into said chamber, and a one-way valve, said valve being positioned so that nothing can flow through said channel without flowing through said valve and said valve being operable so that it permits flow only into said chamber until the pressure is reduced to a safe level so that said valve can be opened to allow the contents of said chamber to escape slowly and to eventually flow out of said liquid sodium outlet, said energy absorber being capable of withstanding the pressure resulting from an inadvertant water-sodium reaction over the entirety of said sidewall; whereby when water is carried by said tubes, said tubes are heated by a stream of liquid sodium flowing from said liquid sodium inlet to said liquid sodium outlet and said channel extends into said stream of flowing sodium and said chamber contains gas, an inadvertant sodium-water reaction will result in a pressure buildup which is attenuated because sodium and the products of said reaction will enter said chamber through said channel to compress said gas with the products of said reaction being retained within said energy absorber.

3,924,676

HEAT EXCHANGER

John Charles Bennett, Ponteland, England, assignor to Clarke Chapman-John Thompson Limited, Durham, England

Filed Sept. 20, 1973, Ser. No. 399,235
Claims priority, application United Kingdom, Sept. 23, 1972, 44099/72
Int. Cl. F28f *9/00*
U.S. Cl. 165—172 **5 Claims**



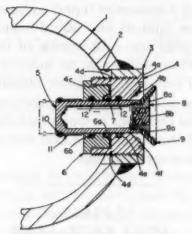
1. In combination for securing tube passes to a member extending past several tube passes, abutment means each having two oppositely facing contoured outer faces in securing engagement with and partly surrounding respective adjacent tube passes, at least some of said abutment means each comprising two abutment portions each having one of said contoured faces, and having an inner inclined surface, the inclined surfaces of said two abutment portions lying between said adjacent tube passes and converging towards one another as they approach said member, a wedge shaped and interposed between said two abutment portions in a position to maintain said contoured faces of said abutment portions in securing relationship with said respective adjacent tube passes and to maintain said two abutment portions in engagement with said member, and a securing device engaging said wedge and said member for securing, under a predetermined load, said wedge to said member in said position, others of said abutment means comprising unitary blocks each having said two oppositely facing contoured faces, said unitary blocks being fixedly secured to said member.

3,924,677

DEVICE FOR USE IN THE COMPLETION OF AN OIL OR GAS WELL

Amnon Prenner; Jacob Bear; David Tohar, all of Haifa, Israel, and Harry Koplin, Miami, Fla., assignors to Harry Koplin, Miami, Fla.

Filed Aug. 29, 1974, Ser. No. 501,622
Int. Cl.[2] E21B 33/12
U.S. Cl. 166—100 16 Claims



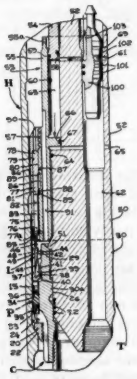
1. An apparatus for providing a passage between an earth stratum and the interior of a well casing comprising a movable hollow conduit member mounted in the casing wall initially held retracted and immovable while the casing is lowered and subsequently after the casing is set extended outwardly from the casing wall to contact said stratum, a dissolvable plug initially blocking the bore of said conduit member, the improvement wherein said plug is water soluable and said apparatus includes removable means on each end of said plug which prevent premature contact of said plug by water.

3,924,678

CASING HANGER AND PACKING RUNNING APPARATUS

Arthur G. Ahlstone, Ventura, Calif., assignor to Vetco Offshore Industries, Inc., Ventura, Calif.

Filed July 15, 1974, Ser. No. 488,430
Int. Cl.[2] E21B 23/06, 33/035
U.S. Cl. 166—120 30 Claims



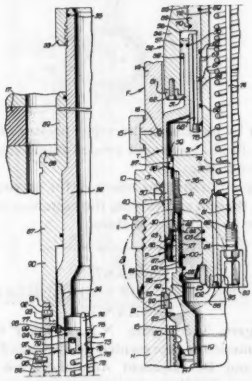
24. A running and operating tool for setting a packing and locking assembly between a wellhead housing and a hanger for a tubular well conduit comprising: a body having means at its upper end connectable to a running pipe string; means at the lower end of said body; means adapted to releasably connect said last-mentioned means to the hanger; a cylinder sleeve reciprocable relative to said body; said cylinder sleeve and said body having means defining a piston chamber; a piston on said cylinder sleeve and in said piston chamber; passage means for admitting fluid under pressure to said piston chamber; said cylinder sleeve having means enabling releasable connection with said packing means; and actuator means responsive to fluid pressure outside of said tool including an actuator member shiftable longitudinally of said cylinder sleeve.

3,924,679

PRESSURE OPERATED APPARATUS FOR RUNNING AND SETTING PACKING ASSEMBLIES IN WELLHEADS

Martin B. Jansen, Jr., Ventura, Calif., assignor to Vetco Offshore Industries, Inc., Ventura, Calif.

Filed Aug. 7, 1974, Ser. No. 495,269
Int. Cl.[2] E21B 23/00
U.S. Cl. 166—182 23 Claims



1. Apparatus for effecting a seal between a wellhead housing below a blowout preventer means and a hanger disposed in said housing for supporting a tubular string extending into a well bore comprising: a running tool having a body structure connectable to a running pipe string, packing means, means releasably connecting said packing means to said body structure, actuator means disposed between and engageable with the blowout preventer means and packing means for setting said packing means between said housing and said hanger, and locking means for holding said packing means in set condition, said actuator means including fluid pressure operated piston and cylinder means for applying a setting force to said packing means and a reactive force to the blowout preventer means with said actuator means in engagement with the blowout preventer means and packing means.

3,924,680

METHOD OF PYROLYSIS OF COAL IN SITU

Ruel C. Terry, Denver, Colo., assignor to In Situ Technology, Inc., Denver, Colo.

Filed Apr. 23, 1975, Ser. No. 570,714
Int. Cl.[2] E21B 33/138, 43/24, 43/26
U.S. Cl. 166—258 8 Claims

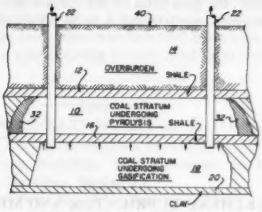
1. A method of pyrolysis of coal in situ comprising the steps of:

establishing a hermetically sealed passage between a subsurface coal formation and a surface location wherein said passage includes means for removing both liquids and gases from the coal formation,

heating at least a portion of the coal formation,

driving fluid tars in the coal which are mobilized by the heat outwardly from the heated portion and allowing them to solidify in lower temperature portions of the coal formation to define a fluid impervious barrier around the

heated portion, and



allowing volatile material released from the heated coal to be removed through said passage and flow to a surface location.

3,924,681

METHOD OF USING OVERBASED CRUDE OIL AS WATERFLOOD ADDITIVE

Charles R. Clark; M. Duane Gregory; Burton M. Casad, all of Ponca City, Okla.; Delmar D. Krehbiel, Lubbock, Tex., and Carl D. Kennedy, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Apr. 30, 1973, Ser. No. 355,635
Int. Cl.[2] E21B *43/22*
U.S. Cl. 166—270 **8 Claims**

1. a process for recovering hydrocarbons from a petroliferous formation which consists essentially of:

d. injecting into the formation an effective amount of an aqueous mixture which contains about 0.5 to about 25 weight percent of an overbased waterflood additive; the water-flood additive comprising a base component plus a sulfonated virgin crude oil; wherein the waterflood additive is sufficiently overbased that the ratio: "weight of excess base component/weight of sulfonate" is about 0.03 to about 3.0; wherein the base component is sodium hydroxide; wherein the sulfonated virgin crude oil is derived from a crude oil having an API gravity of at least 25 and an aromatic hydrocarbon content of at least 15 percent by weight; and

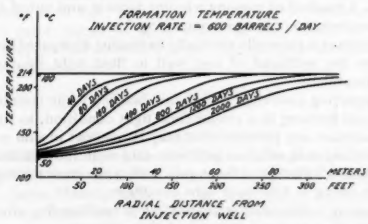
e. recovering the displaced hydrocarbons from the formation.

3,924,682

METHOD OF TREATING A HIGH TEMPERATURE FORMATION TO PERMIT THE USE THEREIN OF TEMPERATURE SENSITIVE SURFACTANTS

Ching H. Wu; Alfred Brown; Wann-Sheng Huang, and Yick-Mow Shum, all of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Oct. 16, 1974, Ser. No. 515,276
Int. Cl.[2] E21B *43/22, 43/24*
U.S. Cl. 166—274 **10 Claims**



1. A method of recovering petroleum from a subterranean, petroleum containing formation by means of surfactant flooding wherein the formation temperature exceeds the temperature at which the surfactant is stable which comprises:

introducing a cooling fluid into the formation at a temperature substantially lower than the temperature at which the surfactant is stable for a period of time sufficient to reduce the portion of the formation to be contacted by the surfactant to a temperature level at which the surfactant is stable.

3,924,683

METHOD FOR ENHANCING THE RECOVERY OF OIL USING STEAM STIMULATION PROCESS

William D. George, Missouri, and Chin-Wen Shen, Houston, both of Tex., assignors to Getty Oil Company, Los Angeles, Calif.

Filed Oct. 15, 1974, Ser. No. 514,835
Int. Cl.[2] E21B *43/24*
U.S. Cl. 166—303 **25 Claims**

1. A method for enhancing the recovery of oil from an underground reservoir having a well communicating thereto, comprising:

providing a source of steam for said well;

adding caustic material to said steam so that the concentration of said caustic material in said steam is in excess of 500 parts per million;

injecting said steam containing said caustic material into said reservoir through said well for a first period of time;

terminating the injection of said steam, and thence commencing the production of well fluids from said well;

continuing the production of well fluids for a second period of time, said first period and said second period defining a steam stimulation cycle;

terminating said production period; and,

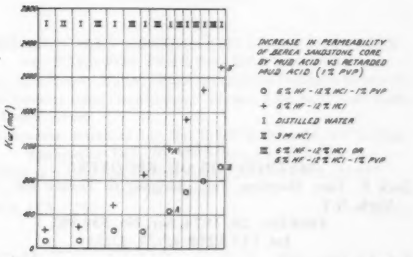
repeating said steam stimulation cycle several times.

3,924,684

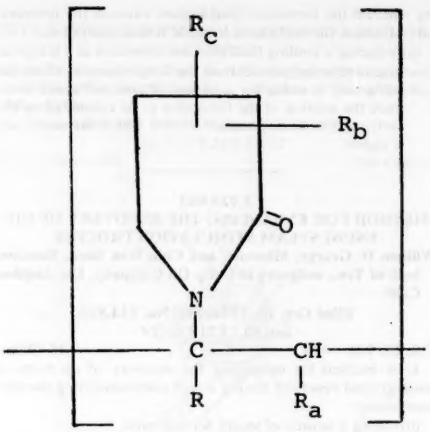
METHOD FOR STIMULATING WELL PRODUCTION

Jack F. Tate, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 20, 1973, Ser. No. 426,998
Int. Cl.[2] E21B *43/27, 43/26*
U.S. Cl. 166—307 **12 Claims**



5. A method of increasing the production of fluids from a subterranean fluid bearing formation having present therein sandstone and clay components comprising injecting therefrom into said formation under a pressure greater than the formation pressure an aqueous well acidizing composition comprising an aqueous solution of from about 5 to about 12 percent by weight of a mineral acid selected from the group consisting of hydrochloric and sulfuric acid, from about 3 to about 7 percent by weight of hydrofluoric acid and having dissolved therein from about 0.5 to about 5 percent by weight of a vinylpyrrolidone polymer comprising recurring units of the formula:



wherein R, R_a, R_b and R_c are independently selected from the group consisting of hydrogen and alkyl radicals having from 1 to 5 inclusive carbon atoms, maintaining said composition in contact with the formation for a time sufficient for the acid to chemically react with the acid-soluble components of the formation to etch passageways therethrough thereby increasing substantially the flow capacity of the said subterranean formation.

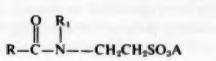
3,924,685

METHOD FOR OIL RECOVERY

Jack F. Tate, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,982
Int. Cl.[2] E21B *43/25, 43/26*
U.S. Cl. 166—308 **13 Claims**

1. Method of increasing and sustaining the production of fluids from a subterranean fluid-bearing formation comprising injecting down the well bore penetrating said formation and injecting therefrom into said formation under a pressure greater than the formation pressure, an aqueous solution containing a water-soluble substituted taurine having the following general formula:



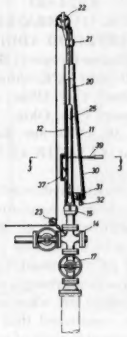
wherein R and R_1 are aliphatic hydrocarbon groups, including the corresponding unsaturated aliphatic hydrocarbons, mixtures and isomers, each group containing from 1 to 20 carbon atoms therein, the sum total of the carbon atoms in R and R_1 being between 9 and 30, and A is an alkali metal or ammonium ion.

3,924,686

WELLHEAD LUBRICATOR AND METHOD

James F. Arnold, Houston, Tex., assignor to HydroTech International, Inc., Houston, Tex.

Filed Mar. 14, 1975, Ser. No. 558,429
Int. Cl.[2] E21B *23/00*
U.S. Cl. 166—315 **12 Claims**



1. A wellhead lubricator having a housing arranged for vertically extending attachment to a wellhead assembly and having a wireline for supporting a wireline tool therein and passing said wireline tool in and out of said well through the point of attachment to said wellhead, the improvement comprising:

said housing having a portion extending laterally therefrom and normally forming a part of the pressurized chamber in said housing;

said laterally extending portion having another tool opening for passage of a wireline tool therethrough while said housing remains attached to said wellhead;

means for closing said other tool opening after passage of said tool therethrough;

and guide means supported in said housing for guiding a wireline tool to said other opening when said tool is to be removed from said housing.

11. A method of running wireline tools in and out of a well, the combination of steps comprising:

attaching a generally vertically extending elongated housing to the wellhead of said well in fluid tight relationship therewith;

supporting a wireline tool in said housing while maintaining said housing in a closed fluid tight condition, to thereby contain any pressure that may be present in said well;

lowering said wireline tool into said well and withdrawing said wireline tool from said well while maintaining said housing in said fluid tight condition;

shutting in said well at a point below said housing after said wireline tool is withdrawn from said well;

opening said housing and removing said wireline tool therefrom while said housing remains attached to said wellhead and while said well is shut in;

inserting another wireline tool into said housing while said housing remains attached to said wellhead;

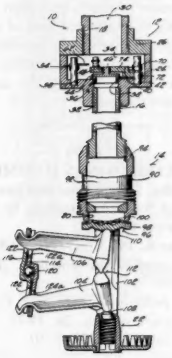
closing said housing to form a fluid tight chamber therein; and lowering said other wireline tool into said well and withdrawing said other wireline tool from said well while maintaining said housing in said fluid tight condition.

3,924,687

VALVE AND SPRINKLER HEAD FOR AUTOMATIC FIRE EXTINGUISHING SYSTEMS

Richard T. Groos, Hastings, Mich., assignor to The Viking Corporation, Hastings, Mich.

Filed Feb. 20, 1974, Ser. No. 443,962
Int. Cl.² A62C *37/10*
U.S. Cl. 169—19 **25 Claims**



1. An automatic sprinkler control mechanism comprising, in combination: means defining a flow passageway having an inlet and outlet, said inlet adapted for connection to a source of fire extinguishing fluid, said outlet adapted to dispense said fluid; first and second valve means in said passageway, said first valve means being movable between closed and open positions, said second valve means being movable from a closed to an open position; first condition responsive means including first sensing means responsive to a fire condition and first actuator means responsive to said first sensing means and cooperatively associated with said first valve means for opening said first valve means when the fire condition about said first condition responsive means reaches a preselected fire condition level and for closing said first valve means when the fire condition level is below said preselected level; second condition responsive means including second sensing means responsive to a fire condition and second actuator means responsive to said second sensing means and cooperatively associated with said second valve means for causing said second valve means to open when the fire condition level about said second condition responsive means reaches a second preselected level.

3,924,688

FIRE FIGHTING SYSTEM

Earl A. Cooper, Los Angeles, and Roger C. Stephenson, Woodland Hills, both of Calif., assignors to G & H Technology, Inc., Santa Monica, Calif.

Filed Apr. 5, 1974, Ser. No. 458,221
Int. Cl.² A62C *37/04*
U.S. Cl. 169—61 **17 Claims**

1. An electromechanical mechanism for a non-explosive initiation of an actuator, said mechanism including:

a plurality of separable spool sections secured together and formed to have a recess therebetween,

a pair of electrical terminals on one of said sections,

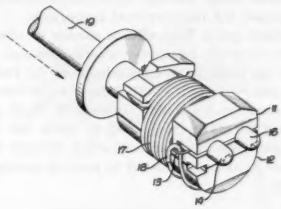
wrapping means wrapped around said plurality of spool sections for applying circumferential tension thereto to maintain said sections together,

a securing portion formed on said wrapping means,

an electrically conductive element engaged by said securing portion, said electrically conductive element being connected to said terminal,

a movable member disposed at one end in said recess,

a utilization device coupled to said movable member whereby the movement of said utilization device and said movable member are restrained by the application of circumferential tension by said wrapping means to said plurality of separable spool sections, and



a source of electrical current coupled to said electrically conductive element, said electrically conductive element having a tension greater than said circumferential tension applied by said securing means to said plurality of separable members at ambient temperatures, said tension of said electrically conductive element being less than said circumferential tension when said tension element is heated up by current applied by said source of electrical current,

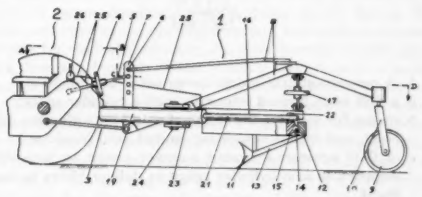
whereby the application of current by said source of electrical current disengages said securing means from said electrically conductive tension element to enable said movable member to initiate actuation of said utilization device.

3,924,689

HYDRAULICALLY CONTROLLED GRADER-LEVELER ADAPTED FOR TRAILING BY TRACTORS

Gedalyahu Manor, Haifa, Israel, assignor to Technion Research and Development Foundation, Ltd. and Aharon Kipnis, both of Haifa, Israel

Continuation-in-part of Ser. No. 266,078, June 26, 1972. This application Dec. 20, 1973, Ser. No. 426,522
Claims priority, application Israel, July 4, 1971, 37217
Int. Cl.² E02S *3/76*
U.S. Cl. 172—780 **11 Claims**



1. Off-center overload protected grader-leveler apparatus comprising

a chassis having means at its forward end for trailing attachment to a farm tractor and, at its rear end, means for

supporting the chassis above ground, said tractor having a hydraulic system including a collecting vessel;

a blade support means, and means rotatably securing the blade support means to the chassis to enable the support means to swing about an essentially vertical axis to permit selective positioning of the support means with respect to said chassis;

a grading and leveling blade supported by the support means;

blade positioning means, quick release means including a hydraulic piston motor having a cylinder;

means connecting the movable force transmitting portion of the hydraulic motor to the blade support means;

and means controlling application of pressurized fluid, selectively, to a side of the piston of the motor in order to rotate the blade support means, and hence the blade about its axis and bring it into a desired position; wherein, to avoid blade damage upon encountering an off-center overload, the improvement comprises

controlled quick fluid release means to open and release fluid from the respective overloaded side of the piston into the collecting vessel whenever the fluid pressure on the piston exceeds a limit defined by an excessive off-center load on the blade, release of fluid permitting the piston to move freely and to allow the blade support means with the blade attached thereto to turn freely about its axis and thereby to prevent damage to the apparatus.

3,924,690

PERCUSSION DRILL CONTROL MEANS

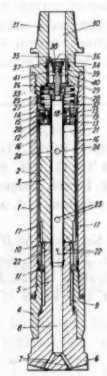
Alan Shaw, Halifax, England, assignor to Halifax Tool Company Limited, Halifax, England

Filed Dec. 5, 1973, Ser. No. 422,068

Claims priority, application United Kingdom, Jan. 9, 1973, 1142/73

Int. Cl.² E21B *5/00;* **E21C** *7/00*

U.S. Cl. 173—13 **7 Claims**



1. A percussion drill which comprises in combination:

a. a drill body formed internally with a cylinder space;

b. means for securing the shank of a drill bit within the drill body, said means permitting limited axial freedom;

c. a fluid pressure-operated hammer piston reciprocably disposed in said cylinder space to deliver blows to said shank;

d. a central tube extending axially through a distributor valve assembly near one end of the tube and axially through said hammer piston to a central bore of the shank of said drill bit, said central tube having limited freedom for axial movement with said shank;

e. a bush with central bore disposed in said one end of the central tube, the rear surface of the bush being exposed to a supply of compressed air, the front face of the bush ordinarily exposed to pressure within the central tube;

f. a spigot extending forwardly and disposed in an inlet passage for compressed air within the rear end of the drill body, said spigot disposed as a shut-off valve assembly for air within the central tube when in mating contact within the bush; and

g. exhaust port means in said central tube positioned for communication with said cylinder space and cooperative with said hammer piston to control the reciprocation thereof, the central tube communicating with an exhaust passage in said shank and extending to a bit flushing passage

h. whereby cooperation of the fixed spigot in said body with said bush providing a clearance between the spigot and bore of the bush which varies in accordance with the longitudinal position of the tube within the drill body, a space surrounding the said rear end of said central tube and the said spigot communicating with a pressure fluid supply passage upstream of the hammer piston for venting pressure fluid to the bore of the central tube upon forward movement thereof.

3,924,691

COMBUSTION ENGINE DRIVEN HAMMER MACHINES

Kurt Östen Brännström, Saltsjo-Boo, and Levi Johannes Karlfors, Nacka, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

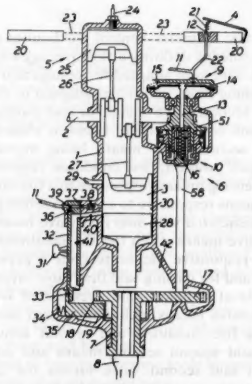
Filed June 8, 1973, Ser. No. 368,081

Claims priority, application Sweden, June 30, 1972, 8601/72

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² B25D *9/10*

U.S. Cl. 173—48 **5 Claims**



1. A device relating to combustion engine driven hammer machines and comprising a machine housing, a crankshaft which is arranged in the machine housing and connected to a compressor piston and driven by a combustion engine, a throttle controlling said engine, a device comprising a servomotor, which is controlled in dependence on the position of the throttle, for transferring rotation from the crankshaft to a drill-sleeve for rotating a tool which is inserted into the drill-sleeve, and a clutch unit which is actuated by the servomotor for engagement or disengagement of the rotation.

5. A device according to claim 1, in which a function selector comprising an essentially cylindrical part, which is guided in the machine housing and provided with, an eccentric first terminal for actuating a spring-loaded dog for barring the

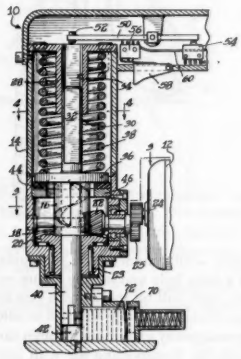
drill-sleeve against rotation when the function selector is in a certain adjustment position, and a second-terminal which is made as a slide-valve for blocking the transferring of fluid-pressure, created by the compressor piston, to the servomotor when the function selector is in said adjustment position, through which the rotation remains disengaged independent of the adjustment of the throttle.

3,924,692

FASTENER DRIVING TOOL

Oliver Edward Saari, Niles, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Feb. 6, 1974, Ser. No. 440,224
Int. Cl.[2] B25C *1/06*
U.S. Cl. 173—117 **8 Claims**



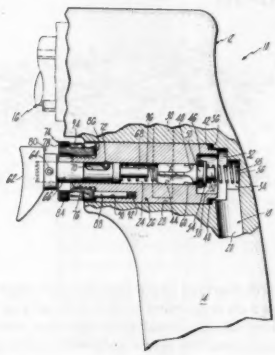
1. In a fastener driving tool, a housing, driving means mounted for axial reciprocating movement therein, the driving means including an elongate ram, guide shaft and a cup-shaped piston opening rearwardly of the housing and the ram including a base portion extending radially outwardly of both the guide shaft and the ram and further including upstanding wall portions extending longitudinally of the housing from the base portion, said piston being located between the ram and guide shaft, seal means positioned between the upstanding wall portion of the piston and the associated inner periphery of the housing, a first helicoidal cam means fixedly attached to the driving means so that the ram extends coaxially through the cam means, a rotatable means for actuating the driving means including a second helicoidal cam means fixedly attached to a gear for rotation about the axis of the ram, a bore extending through the actuating means and second helicoidal cam to allow the ram to pass therethrough and create an impact force on a fastener positioned beneath the cams, compressible spring means in the housing to urge the driving means forwardly in the housing toward the second cam means, the spring means comprising a chamber at the rearmost extremity of the housing, a predetermined volume of gas stored in the chamber, valve means in the chamber to selectively vary the bias of the gas spring means on the cup-shaped piston, a sleeve mounted in the chamber and extending forwardly therein, coaxial with the guide shaft to receive the guide shaft during the reciprocation of the driving means in the housing, the housing also including shoulder means to support the cup-shaped piston when the driving means is in its forward position in the housing, resilient cushion means positioned between the piston and the shoulder means to absorb the impact shock of the driving means and thus prevent abutting cam surfaces to impact each other, a drive shaft driven by a source of rotary power located adjacent the housing, gear means operatively connecting the drive shaft to the gear attached to the second helicoidal cam means to transmit rotary motion to the actuating means, the helicoidal cams including sharp drop-off portions which allow the spring means to periodically drive the ram forwardly to drive a fastener.

3,924,693

FLUID OPERATED TOOL HAVING SELF-COMPENSATING THROTTLE VALVE

Hugh L. Whitehouse, Lyndhurst, Ohio, assignor to The Stanley Works, New Britain, Conn.

Continuation of Ser. No. 208,217, Dec. 15, 1971, abandoned.
This application July 11, 1973, Ser. No. 378,154
Int. Cl.[2] B23B *45/04*; **F15B** *13/04*
U.S. Cl. 173—169 **3 Claims**



1. In a power tool having a pneumatically operated drive motor, a control valve having a fluid inlet adapted to be connected to a pneumatic pressure source and a fluid outlet connected to the drive motor, a valve bore interconnecting the valve inlet and valve outlet providing a fluid passageway therebetween, a valve seat surrounding the bore intermediate the valve bore inlet and outlet, a valve member mounted in the bore shiftable in first and second opposite axial directions therein respectively to and from a respective closed position thereof for selectively seating on said valve seat and closing said fluid passageway and providing a variable and decreasing fluid restriction between the valve inlet and outlet as the valve member is shifted in said second opening direction from its closed position, the valve member being mounted to be biased in the first closing direction by the valve inlet pressure and in the second opening direction by the valve outlet pressure, the valve member being mounted in the bore such that the net fluid pressure force on the valve member is in said first closing direction and is a function of the pressure drop from the valve inlet to the valve outlet and therefore the fluid restriction therebetween, first spring means biasing the valve member in said closing direction and manually operated valve control means for selectively shifting the valve in said opening direction for controlling the pneumatic operation of the drive motor, the improvement wherein the manually operated valve control means comprises second spring means biasing the valve member in the opening direction and manual actuator means for manually actuating the valve member in said opening direction from its closed position, said manual actuator means closing the bore at an end thereof and continuously sealing the bore from atmosphere, said second spring means being mounted between said valve member and said manual actuator means, said manual actuator means manually selectively varying the opening spring bias on the valve member in excess of the opposing closing spring bias on the valve member such that the open axial position of the valve member is dependent on the relative opening and closing spring bias on the valve member and on the pressure drop and therefore the fluid restriction between the valve inlet and valve outlet and the valve member automatically compensates for drive motor

speed and therefore drive motor load for varying the valve opening in accordance with the drive motor load.

3,924,694

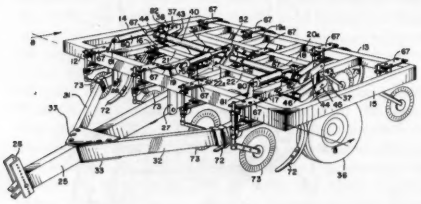
CHISEL PLOW

Herbert W. Baughman, Vermont, Ill. 61484, and Harry G. Yetter, Colchester, Ill. 62326

Continuation-in-part of Ser. No. 366,152, June 1, 1973, Pat. No. 3,812,919, which is a continuation of Ser. No. 225,180, Feb. 10, 1972, abandoned. This application Feb. 14, 1974, Ser. No. 442,586

Int. Cl.[2] A01B *63/22, 63/16, 59/04*

U.S. Cl. 172—413 **3 Claims**



1. An earth working apparatus having a rigid frame structure mounted on supporting wheels and carrying a plurality of earth working devices, said frame structure comprising front and rear transverse end frame members connected at respectively opposite sides of the frame structure by longitudinally extending side frame members, a pair of longitudinal frame members spaced respectively inwardly from said side frame members at opposite sides of the frame structure connecting said front and rear end frame members to define wheel openings in the frame structure, a transversely disposed frame member spaced inwardly from said rear transverse end frame member and connecting said longitudinal frame members, a pair of transversely extending frame members spaced inwardly from said front transverse end frame member and extending inwardly respectively from said longitudinal frame members at opposite sides of the frame structure and spaced apart at their inner ends upon opposite sides of the longitudinal centerline of the frame structure, a pair of central longitudinally disposed frame members spaced respectively equidistant upon opposite sides of said longitudinal centerline extending between said front and rear transverse end frame members, said transversely disposed frame member and said pair of transversely extending frame members extending through said central longitudinally disposed frame members and all of said frame members being integrated by welding, said supporting wheels being operatively mounted on vertically disposed wheel mounts in said respective wheel openings, a first and second set of parallel links each having a pivotal connection with each said wheel mount and said first set of links having a pivotal connection directly with said frame structure, a crank axle pivotally mounted on the frame structure and connecting the second set of links with the wheel mount said second set of links pivotally mounted on the frame structure by said crank axle in vertically spaced relation to said pivotal connection of the first set of links, a generally vertical crank arm secured to one of the links of said second set of links at each wheel mount, a pair of hydraulic cylinders each pivotally connected at one end thereof to each said crank arm and pivotally connected at their respectively opposite ends on said frame structure whereby to impart a rotative action on said sets of links about their pivotal connections with said frame structure and thereby move said wheel mounts in a vertical direction, said crank axle having a generally vertical crank arm fixed thereto and disposed intermediate said crank arms at said wheel mounts, and a hydraulic cylinder pivotally connected at one end thereof to said crank axle crank arm and pivotally connected at its opposite end on said frame structure whereby to impart a rotative action on said crank axle.

3,924,695

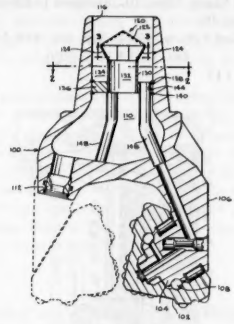
ROTARY DRILLING METHOD AND APPARATUS

John R. Kennedy, 1110 W. Glen-P.O. Box 50485, Tucson, Ariz. 85703

Filed Oct. 2, 1974, Ser. No. 511,364

Int. Cl.[2] E21B *9/08, 9/35*

U.S. Cl. 175—69 **17 Claims**



1. In a rotary drill system of the type using drill stems extending into a bore hole and having means securing a drill bit to said stems, said drill bit including a plurality of drill cones rotatably mounted on bearings secured to said bit, said system including a passageway extending through said stems and into said bore hole for transporting air with lubricant entrained therein, the improvement comprising:

separating means mounted in said passageway for separating said air and lubricant;

means defining a second passageway extending from said separating means through said drill bit for carrying air from said separating means into said bore hole; and

means defining a third passageway extending from said separating means to said bearings for carrying lubricant from said separating means to said bearings.

16. A method of lubricating a roller cutter operably mounted on a drill stem having drilling fluid circulating therethrough including the steps of:

injecting lubricant into the circulating drilling fluid,

separating a substantial portion of the lubricant from the circulating drilling fluid,

conducting the lubricant into the interior of said roller cutter, while

discharging a major portion of the drilling fluid to the exterior of the drill stem.

3,924,696

METHOD AND DEVICE FOR DUST COLLECTING AIR-FLUSHED ROCK DRILLING

Dick Axel Horlin, Handen, and Klas Goran Gunnarsson Ek, Tyreso, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Sept. 5, 1972, Ser. No. 286,614

Claims priority, application Sweden, Sept. 8, 1971, 11355/71

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] E21B *21/00;* **E21C** *7/02*

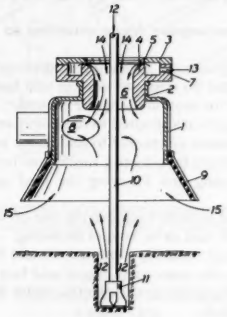
U.S. Cl. 175—209 **12 Claims**

10. Device for dust collecting during air-flushed rock drilling characterized by the combination of:

a shell adapted to be located adjacent the rock surface, said shell being open at its forward end and being provided with a drill stem opening at its rear end, said drill stem

opening of the shell being dimensioned so as to allow passage of a drill bit therethrough,

an air ejector provided at the rear end of the shell for producing a forwardly directed air flow through an annular space defined between said drill stem opening and the drill stem, said air ejector including an annular slot through which pressure air is injected in a substantially



radial direction, and a neck ring provided with a curved contour for linking the injected air flow forwards, through the annular space, said neck ring having a minimum internal diameter which is smaller than the diameter of said annular slot, and

an outlet opening in the shell for connection to a suction device for draining of the air and dust from the shell.

3,924,697

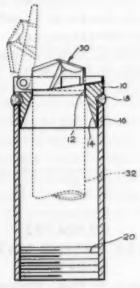
EXCAVATING TOOL

Michael A. College, Everett, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Filed June 12, 1974, Ser. No. 478,503

Int. Cl.[2] E21B *9/00*

U.S. Cl. 175—382 **9 Claims**



1. In an excavating tool; an annular bit body having a central opening therethrough, an end portion extending from one end of said body smaller in diameter than the bit body and adapted for coaxial extension inside a tubular member to be fixedly held there for rotation on a central axis, the central opening in said end portion flaring out toward the free end thereof, cutters mounted on and protruding axially from one axial end of said body for reducing a formation into which the tool is advanced while rotating, a bar element extending transversely on said one end of said body, pivot means pivotally connecting one end of said bar element to said body and cooperating elements of abutment means on the other end of said bar element and said body, said abutment means supporting said bar element during excavating operations and said pivot means permitting outward pivotal movement of the bar element to expose said central opening, and cutter means on said bar element for reducing the formation radially inwardly from said cutters on said one end of said body.

3,924,698

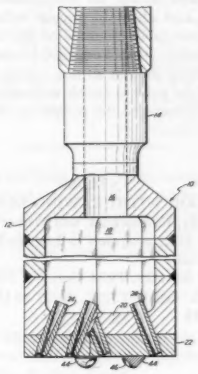
DRILL BIT AND METHOD OF DRILLING

Hans C. Juvkam-Wold, Monroeville, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Apr. 8, 1974, Ser. No. 458,531

Int. Cl.[2] E21C *15/00*

U.S. Cl. 175—393 **4 Claims**



1. In a drill bit for abrasive jet drilling of wells in which nozzles extend through the bottom of the drill bit to discharge from outlets of the nozzles streams of abrasive-laden drilling liquid to cut in the bottom of the borehole a central hole surrounded by a plurality of concentric grooves, said grooves being separated by ridges on which the drill bit is supported, the improvement comprising a plurality of nozzles positioned in the drill bit to discharge streams of abrasive-laden drilling liquid to cut each of the grooves, the ratio of the square of the diameter of the outlets of the nozzles times the number of nozzles for each of the grooves divided by the diameter of the grooves being substantially equal.

3,924,699

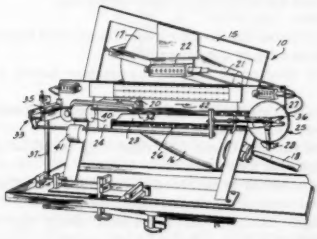
CONVEYOR SCALE WITH INTEGRATOR

Robert B. Chambers, 607 Krall St., Boise, Idaho 83702

Filed Feb. 27, 1975, Ser. No. 553,649

Int. Cl.[2] G01G *11/14, 1/38;* **F16H** *27/02*

U.S. Cl. 177—16 **2 Claims**



1. In a device for use in indicating weight on a conveyor belt or the like comprising a pair of cones mounted for rotation about substantially parallel axes, means for rotating one of the pair of cones as a direct function of the rate of movement of a conveyor belt, transfer means for engaging the surfaces of

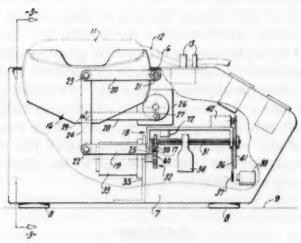
the pair of cones and transmitting rotation of the one cone to the other cone of said pair of cones, means for supporting transfer means for movement along the axes of the pair of cones and means for shifting the transfer means in response to weight on the conveyor belt, the improvements comprising the shifting means including a ratchet wheel having a periphery, a shaft support the ratchet wheel for rotation, means connected to the ratchet wheel for converting movement of the wheel into an output connected to the transfer means, a double ratchet pawl, means for oscillating the pawl in an arc adjacent the periphery of the ratchet wheel, control means for selectively engaging the pawl in response to a weight on the belt, and adjustable means for interconnecting the control means and pawl, said adjustable means including a pin on the pawl, a member rotatably mounted on the control means and a single spring having one end engaged on the member and the other end encircling the pin so that rotation of the member applies a bias on the pawl to enable adjustment of the orientation of the pawl relative to the periphery of the wheel.

3,924,700

BLOOD WITHDRAWING DEVICE

Homer M. Lindsey, Carmichael, and Wilbert D. Silva, Cupertino, both of Calif., assignors to Lifeline Instruments, Inc., Sacramento, Calif.

Filed Nov. 29, 1974, Ser. No. 528,093
Int. Cl.[2] G01G *13/02, 7/00;* **A61M** *1/00*
U.S. Cl. 177—118 **8 Claims**



1. A blood withdrawing device comprising:
a. a frame;
b. a load measuring device on said frame, said load measuring device being a balance beam;
c. a tray adapted to support a container having a supply tube;
d. means for connecting said tray to transmit a load thereon to said load measuring device;
e. means on said frame for controlling the flow of blood through said tube; and,
f. means actuated by said load measuring device for operating said controlling means including:
a weight mounted for movement along said balance beam,
a motor for moving said weight long said balance beam, means for effectuating a number of counts in accordance with said movement,
means for accumulating said counts, and,
means effective at a predetermined number of counts for disabling said motor.

3,924,701

TWO-SPEED, SELF-PROPELLED DOLLY FOR MOVING AND ELEVATING A MOBILE HOME OR OTHER LOAD

Colin G. Johnstone, 38732 Puerta St., Palmdale, Calif. 93550

Filed Oct. 11, 1974, Ser. No. 514,140
Int. Cl.[2] B62D *11/04*
U.S. Cl. 180—6.5 **10 Claims**

1. A self-propelled dolly for moving and elevating a load, comprising:
a generally rectangular frame extending in a longitudinal direction;
a pair of longitudinally extending, endless belt tracks movably mounted on opposite sides of said frame supporting said frame for motion along the ground;
load engaging means adapted to releasably engage the load;
elevating means connected to said frame and to said load engaging means for selective raising and lowering thereof, thereby raising and lowering the load relative to said frame;
a pair of drive systems each driving one of said pair of belt tracks, each said drive system including,
a drive wheel rotatably mounted on said frame drivingly engaging the associated one of said belt tracks;
a reversible, synchronous electric motor having a rotary output shaft;
a two-speed gear box drivingly coupling said output shaft to said drive wheel to drive the associated said belt track thereby moving the frame either at a traverse speed approximately equal to the walking pace of an adult human or at a relative slower, load-carrying speed;
direction selector means connected to said motor and to a remote source of electric power for controlling the rotation of said motor in opposite, forward and reverse directions;
speed selector means connected to said gear box and movable between first and second positions for selecting driving motion of said belt track at the traverse speed or the load-carrying speed, respectively;
connecting means connecting said speed selector means of said pair of drive systems together for operation in unison between said first and second positions to ensure that both said belt tracks are operated at the same speed while allowing said belt tracks to be selectively driven in the same or opposite directions; and
a remotely controlled actuator connected with at least one of said speed selector means for selectively controlling movement thereof between said first and second positions.

3,924,702

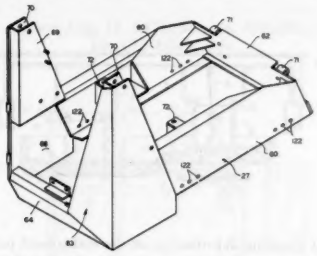
TRACTOR VEHICLE HAVING MATERIAL HANDLING SUBFRAME

John P. Heggen, Lisbon, N. Dak., assignor to Clark Equipment Company, Buchanan, Mich.

Division of Ser. No. 329,939, Feb. 5, 1973, Pat. No. 3,895,728.
This application Aug. 8, 1974, Ser. No. 495,703
Int. Cl.[2] B62D *11/04, 33/00*
U.S. Cl. 180—6.48 **4 Claims**

1. A skid steered loader vehicle comprising a body defined in part by side walls on opposite sides of the vehicle center line, by end walls at opposite ends of the side walls and by a bottom wall partially enclosing a compartment area defining a fluid lubricant reservoir, a pair of stub axles spaced, one axle behind the other, at opposite ends of the compartment and projecting outwardly from each side, tubular axle housings rigidly secured to said side walls and surrounding said stub axles, a mounting boss on each of said tubular axle housings, a loader subframe comprising laterally spaced, longitudinally extending side beams and cross members at each end defining

a generally interior rectangular space for receiving and partially surrounding said body, said side beams having longitudi-



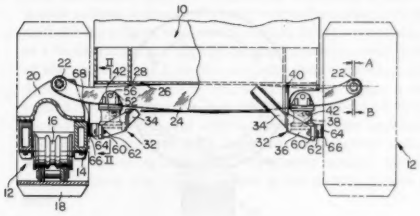
nally spaced mounting locations engageable with said mounting bosses for securing said subframe onto the body.

3,924,703

EQUALIZER BAR ASSEMBLY FOR CRAWLER-TYPE VEHICLES

Robert J. Purcell, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 8, 1974, Ser. No. 522,258
Int. Cl.[2] B62D *55/08*
U.S. Cl. 180—9.54 **5 Claims**



1. In a crawler-type vehicle having a main frame disposed between a pair of track frames and an equalizer bar rockably supporting said main frame and pivotally contacting both of said track frames, the improvement comprising a pair of resilient means, each connected to said equalizer bar at the underside thereof and adjacent corresponding ones of said track frames, said resilient means each further being connected to said main frame whereby rocking movement of said equalizer bar relative to said main frame will cause one or the other of said resilient means to be compressed to thereby improve the stability of the vehicle.

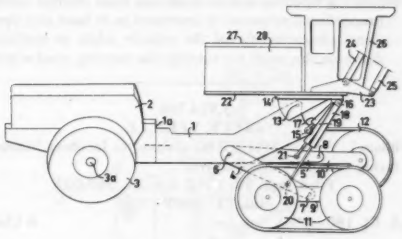
3,924,704

STABILIZING ARRANGEMENT IN TERRAIN-GOING VEHICLES

Karl Thore Lindblom, and Erik Torsten Forslund, both of Alfta, Sweden, assignors to Ostbergs Fabriks AB, Alfta, Sweden

Filed May 31, 1974, Ser. No. 475,292
Int. Cl.[2] B60G *17/00*
U.S. Cl. 180—41 **3 Claims**

1. A stabilizing arrangement in terrain-going vehicles having a driver's cabin and a rearly branched framework where the stem of the branches, constituting the frame of the vehicle, at its front end is supported by a front wheel shaft, and the branches, constituting longitudinal legs, have each of their ends supported by a different rear shaft for a bogie bar, the improvement wherein the rear end of the frame of the vehicle serves as a support for a fundament plate for receiving operation equipment, and the two longitudinal legs are pivoted in alignment with each other at each side of the frame; a separately operable hydraulic jack forming an upstanding and longitudinally variable supporting bar between each leg and an associated point on the plate in order to enable an individual raising and lowering of the rear shafts, the front part of the



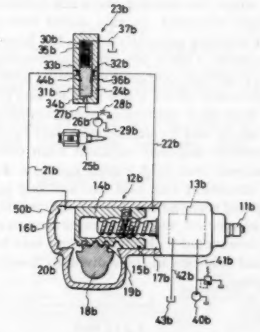
frame, supporting the front wheel shaft, being freely rotatable around its longitudinal axis, whereby it will be possible, on one hand, to straighten up the vehicle including the fundament plate when driving along a lateral slant in the terrain and, on the other hand, to enable a simple and gentle surmounting of obstacles on the ground.

3,924,705

POWER STEERING MECHANISM

Masakazu Sugisawa, Hekinan, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 28, 1972, Ser. No. 310,149
Claims priority, application Japan, Dec. 8, 1971, 46-099186; Dec. 8, 1971, 46-099187
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] B62D *5/10*
U.S. Cl. 180—79.2 R **16 Claims**



1. A power steering mechanism comprising,
a housing provided with a cylinder,
a piston fitted within said cylinder for axial sliding movement therein, operably connected to a steering wheel and defining a pair of opposed fluid chambers within said cylinder,
a sector mounted within said cylinder for operative connection with steering road wheels of a vehicle and operatively connected to said piston,
a reservoir for a fluid,
a pump for the fluid,
a changeover control valve for selectively connecting said reservoir through a first passageway to one of said fluid chambers and said pump through a second passageway to

the other of said fluid chambers depending on the direction of turning of the steering wheel to provide an assist for turning said steering road wheels,

a third passage means connecting said two fluid chambers together,

at least one fluid control valve disposed within said third passage means, and

means for opening said at least one fluid control valve in proportional response to increases in at least one operational characteristic of the vehicle while in motion to decrease the assist for turning the steering road wheels.

3,924,706

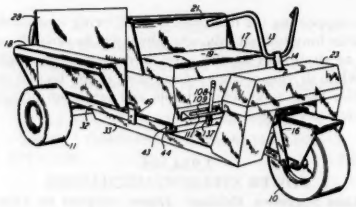
TRUCK VEHICLE

William L. Figura, Bruce, Wis., assignor to Jacobsen Manufacturing Company, Racine, Wis.

Filed Sept. 18, 1974, Ser. No. 507,003

Int. Cl.² B60P *1/04*

U.S. Cl. 180—89 A **6 Claims**



1. A truck vehicle comprising ground engaging wheels, a vehicle frame supported by said wheels and including a forwardly extending portion and a rearwardly extending portion with both said portions respectively extending relative to the fore-and-aft axis of the truck vehicle, a prime mover on said frame for powering the truck vehicle, a drive train connected from said prime mover to said wheels for rotating said wheels, a steering wheel for steering the truck vehicle, an operator's seat pivotally mounted on said frame forwardly extending portion for pivoting upwardly and in the forward direction of the truck vehicle, a truck box pivotally mounted on said frame rearwardly extending portion for pivoting upwardly and in the rearward direction of the truck vehicle, said seat and said box extending from their respective pivot mountings toward each other and along said frame and with said both terminating in upright portions disposed adjacent each other and thereby together extend over said frame, supports on said frame in respective abutment with said seat and said box for upwardly supporting said seat and said box on said frame, and releasable members connected with said frame and respectively being releasably connected with said seat and said box for retaining said seat and said box in their pivotally lowered positions on said supports.

3,924,707

SAFETY INSTRUMENT PANEL FOR MOTOR VEHICLES

Hermann Renner, Magstadt, and Béla Barényi, Maichingen, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

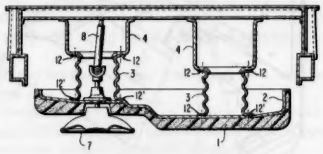
Filed Dec. 7, 1973, Ser. No. 422,680

Claims priority, application Germany, Dec. 7, 1972, 2259906

Int. Cl.² B60K *35/00*

U.S. Cl. 180—90 **10 Claims**

1. A safety instrument panel for motor vehicles, characterized in that the instrument panel is constructed substantially form-rigid and is arranged with a gap with respect to relatively fixed vehicle parts on all sides thereof, and in that the instrument panel is connected with said relatively fixed vehicle parts substantially exclusively by way of energy-absorbing means, said energy-absorbing means being deformation members constructed as impact pots with undulated walls such that a long deformation path of said energy-absorbing means occurs



on impact avoiding deformation of the instrument panel, and further characterized in that the gap provided at the top side of the instrument panel and the fixed vehicle parts is covered off by an undulated sheet metal member.

3,924,708

LUBRICATING AND DRAINING DEVICE

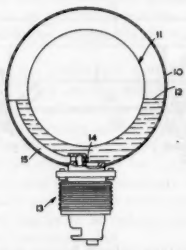
Stanislav Pawel Dabrowka, Leeds, England, assignor to Lucas Aerospace Limited, Birmingham, England

Filed Jan. 25, 1974, Ser. No. 436,810

Claims priority, application United Kingdom, Jan. 25, 1973, 3825/73

Int. Cl.² F01M *11/04*

U.S. Cl. 184—105 R **5 Claims**

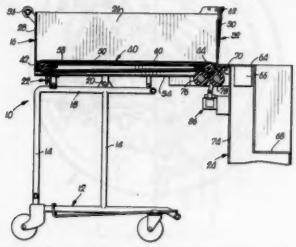


1. A mechanical device of the kind comprising a housing, mechanism within the housing, said housing in use containing lubricant for lubricating the mechanism, a coupling unit mounted in the housing below the desired level of lubricant within the housing, said coupling unit having first and second passages defined therein, a conduit positioned within the housing, said conduit at one end being connected to the first passage within the coupling unit and the other end of said conduit terminating at the desired level of lubricant within the housing. the second passage within the coupling unit communicating with the interior of the housing, said coupling unit comprising a hollow casing, a tube having a wall extending within the casing said tube defining part of said first passage, means closing the end of said tube within the casing, a lateral port formed in the wall of said tube, a plunger slidable within said casing, said plunger defining a bore in which said tube is located, resilient means biasing the plunger within the casing and in a direction away from the housing, a lateral port formed in said bore, said lateral ports being brought into register when the plunger is moved against the action of the resilient means, a cavity defined in said plunger, said cavity opening at one end to said housing and forming part of said second passage, a port formed in the peripheral wall of the plunger, said port communicating with said cavity, a further port formed in the wall of said casing, said ports being brought into communication with each during movement of the plunger against the action of said resilient means.

3,924,709
UNLOADING ASSEMBLY FOR SHOPPING CART

Russell K. Swanson, 3212 Coleman Road, Kansas City, Mo. 64111

Filed Aug. 19, 1974, Ser. No. 498,603
Int. Cl.[2] E04H 3/04
U.S. Cl. 186—1 AC 10 Claims



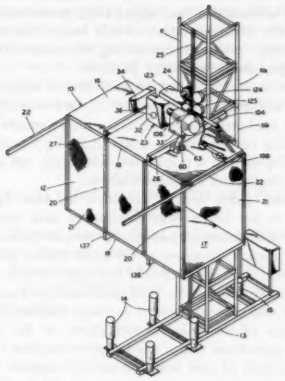
1. An unloading assembly for a shopping cart comprising:
a substantially horizontal conveyor belt carried by the cart and supporting the contents of the cart when in use;
a front and a rear idler roller rotatably carried by the cart, said conveyor belt being trained around said idler rollers;
a stand engageable by the cart; and
driving means on the stand for causing movement of the conveyor belt when the cart is brought into engagement with the stand, said driving means including a pair of driven rollers, a power source for simultaneously driving said driven rollers, said driven rollers being spaced apart in a horizontal plane slightly beneath the horizontal plane of the conveyor belt in the cart, the space between said driven rollers defining a seat, the front idler roller and a stretch of the conveyor belt trained therearound being received within the seat with said stretch of the conveyor belt in engagement with both of said driven rollers whereby, upon actuation of the power source for the driven rollers, the conveyor belt in the cart is caused to move.

3,924,710
RACK AND PINION HOIST

Albert J. Shohet, Cincinnati, Ohio, assignor to Harsco Corporation, Wormleysburg, Pa.

Filed Nov. 30, 1972, Ser. No. 310,962
Int. Cl.[2] B66B 11/04
U.S. Cl. 187—19 3 Claims

1. In a hoist apparatus having a generally upwardly extending tower, a rack secured to the tower, and a lifting frame operatively connected to the tower for generally vertical movement along the tower, drive means on the frame for moving the frame along the tower, bearing means mounted on the frame, a shaft rotatably supported by the bearing means at at least a pair of axially spaced locations, a brake pinion mounted on the shaft for rotation therewith and engaging the rack, the bearing means including a pair of axially spaced support flanges extending generally transversely to the shaft, each flange having a substantially cylindrical surface which is eccentrically related to the longitudinal axis of the shaft, the frame being provided with a pair of generally circular openings which rotatably receive the cylindrical surfaces of the support flanges, and means for releasably securing the bearing means to the frame whereby the position of the axis of the shaft relative to the frame can be changed by releasing the securing means and rotating the cylindrical surfaces of the support flanges within the frame openings, a brake drum mounted on the shaft for rotation therewith, a brake band extending around a portion of the brake drum and having a pair of ends, one end of the brake band being secured to the frame, a plunger reciprocably mounted on the frame and connected to the other end of the brake band, a spring acting on the plunger for biasing the plunger to tighten the brake band about the brake drum, a latch pivotally mounted on the frame for holding the plunger against the bias of the spring, and centrifugal weight means pivotally mounted on the brake drum and movable outwardly under the influence of centrifugal force as the brake drum rotates, the brake pinion being rotated by the rack as the frame moves along the tower

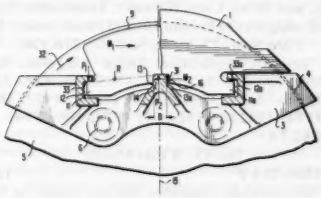


whereby the shaft and the brake drum are rotated, the centrifugal weight means being engageable with the latch when the centrifugal weight means pivot outwardly whereby the latch is pivoted to release the plunger when the rotational speed of the brake drum exceeds a predetermined value whereby the brake band will be tightened about the brake drum to stop the shaft and the brake pinion and thereby stop movement of the frame along the tower.

3,924,711
PARTIAL LINING DISK BRAKE

Friedrich Hoffmann, and Wilhelm von Kamp, both of Stuttgart, Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Mar. 29, 1974, Ser. No. 456,294
Claims priority, application Germany, Sept. 6, 1973, 2344902
Int. Cl.[2] F16D 65/02
U.S. Cl. 188—73.3 8 Claims



1. A partial lining disk brake comprising:
a brake disc means,
brake body means including a first pair of spaced leg portions extending transversely of the axis of rotation of said brake disc means on respective sides thereof and a second pair of leg portions extending substantially parallel to the axis of rotation of said brake disc means and connecting the respective ends of said first pair of leg portions,
side guide rails provided on said brake body means on each side of said brake disc means at an inlet and outlet side

of said brake body means with respect to the direction of rotation of said brake disc means, said side guide rails opening toward each other and extending in the direction of the axis of rotation of the brake disc means,

brake cushion means disposed on each side of said brake disc means, each of said brake cushion means including brake lining means and lining carrier means for supporting said brake lining means, said lining carrier means including an upper edge portion disposed at the periphery of the brake disc means, a lower edge portion disposed radially inwardly of said upper edge portion in the direction of the axis of rotation of said brake disc means, and lateral edge portions connecting the respective ends of said upper and lower edge portions,

projection means provided on each lateral edge portion of each of said lining carrier means at the lower edge portion thereof, said projection means forming a minor portion of said lining carrier means, each of said projection means being disposed in a respective side guide rail so as to be axially displaceably guided therein,

intermediate guide means provided on said brake body means at the lower edge portion of said lining carrier means, said intermediate guide means including guide surface means disposed at an axial center plane of the brake which extends vertially through the axis of rotation of the brake disc means, said guide surface means including first and second support surfaces disposed on respective sides of the axial center plane of the brake and spaced therefrom and a third support surface connecting the free ends of said first and second support surfaces,

intermediate recess means provided on each of said lining carrier means along the lower edge thereof between said side projection means, said intermediate recess means including intermediate guide counter support surfaces which are engageable with said support surfaces of said intermediate guide means,

a floating saddle means displaceably mounted on said brake body means, said floating saddle means including an upper edge portion disposed at the periphery of the brake disc means and a lower edge portion disposed radially inwardly of said upper edge portion in the direction of the axis of rotation of said brake disc means, and

recess means provided in said floating saddle means at the lower edge thereof, said recess means including guide counter support surfaces engageable with said support surfaces of said intermediate guide means.

3,924,712
HYDRAULIC LIQUID OPERATED AND COOLED FRICTION BRAKE

Walter Robert Stirling, Buxton; Christopher Robinson Ellis, Chinley, and Brian Carol Silvester, Leamington Spa, all of England, assignors to Ferodo Limited, Manchester, England

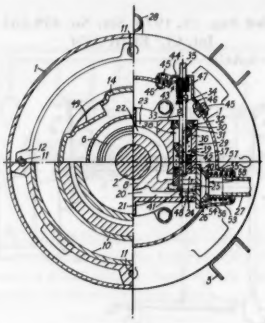
Filed Sept. 27, 1974, Ser. No. 510,126

Claims priority, application United Kingdom, Sept. 29, 1973, 45668/73; Oct. 11, 1973, 47653/73; Oct. 22, 1973, 49149/73; Nov. 2, 1973, 51054/73; Dec. 5, 1973, 56362/73; Mar. 8, 1974, 10423/74; Mar. 9, 1974, 10660/74; Apr. 25, 1974, 18082/74

Int. Cl.² F16D *65/853*

U.S. Cl. 188—264 F **12 Claims**

1. An hydraulically operable friction brake of the kind wherein the hydraulic liquid also provides the medium for removing the heat generated during operation of the brake, comprising (i) a casing, (ii) a rotary member mounted in the casing, (iii) a pressure-operable retarding device arranged and adapted to act upon the rotary member to generate retarding torque, (iv) a pump for circulating hydraulic liquid, (v) two separate fluid circuits provided between the pump and the retarding device one being an actuating circuit arranged and adapted to operate the retarding device, and (vi) valve means comprising (*a*) a valve member, (*b*) a first valve element secured to said member, (*c*) a second valve element slidable on said member and urged away from the first valve element by a spring and constituting pressure sensitive means arranged



and adapted to control distribution of flow of hydraulic liquid between the two circuits, and (*d*) means for equilibrating hydraulic pressure across the valve means.

3,924,713
VEHICLE BRAKING DEVICES

Pierre Etienne Bessiere, Gold St.-Nom-la-Breteche, France, assignor to Labavia S.G.E., Paris, France

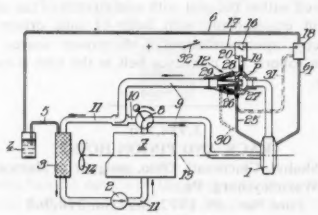
Filed May 10, 1973, Ser. No. 358,939

Claims priority, application France, May 26, 1972, 72.19058

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² F16D *57/02*

U.S. Cl. 188—296 **11 Claims**



1. Hydraulic vehicle braking apparatus, comprising

a housing;

a closed fluid system for supplying fluid to, and emptying fluid from said housing, said system including an expansion vessel (**3**);

a first purging pipe (**6**) connecting the center portion of said brake housing with the top of said expansion vessel, whereby the inner gaseous volume at the center of said brake means is conducted to the top of the vessel;

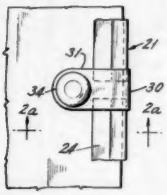
valve means (**18**) connected in said purging pipe, said valve means being operable between open and closed conditions to afford and to interrupt communication, respectively, between said housing and said expansion vessel; and

means responsive to the pressure of the fluid emptying from said housing in said system for controlling the operation of said valve means to cause said valve means to be in the open condition for a given time delay period (t_A) during the initial filling of the housing and to be in the closed condition during the remainder of the filling period, said control means being operable to cause said valve means to be in the open condition during the entire period of emptying of fluid (t'_A) from said housing.

3,924,714
LUGGAGE WITH BINDING STRIP AND METHOD OF MAKING SAME

James K. Bernard, Smyrna, and Pasquale Robert Sollazzi, Newark, both of Del., assignors to Rapid-American Corporation, New York, N.Y.

Filed July 31, 1974, Ser. No. 493,312
Int. Cl.[2] A45C *13/36*
U.S. Cl. 190—18 R 7 Claims



1. In luggage having a principal wall and an adjacent wall connected to and substantially normal to said peripheral wall; a peripheral binding strip secured to at least one of said walls at the connection between said principal wall and said adjacent wall;

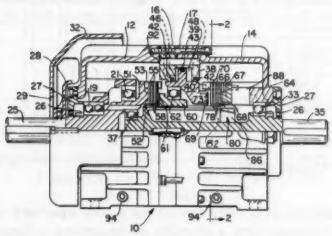
the ends of said peripheral binding strip being unsecured to each other and lying adjacent each other;

a cover member for said adjacent ends of said binding strip; means for securing said cover member in place; said cover member spanning and concealing said unsecured adjacent ends of said binding strip.

3,924,715
CLUTCH-BRAKE UNIT

Halsey W. Cory, Fairfield, Ohio, assignor to Force Control Industries, Inc., Hamilton, Ohio

Filed Apr. 17, 1974, Ser. No. 461,504
Int. Cl.[2] F16D *67/06*
U.S. Cl. 192—18 A 8 Claims

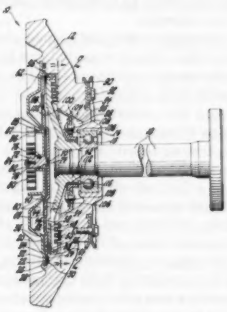


1. In clutch-brake unit including a housing for containing a supply of oil and having first and second opposite end portions, an input shaft rotatably supported by said first end portion of said housing, an output shaft rotatably supported by said second end portion of said housing and extending in axial alignment with said input shaft, a first series of interfitting clutch plates and clutch discs within said housing, said clutch plates mounted on said input shaft for rotation therewith and the interfitting said clutch discs mounted on said output shaft for rotation therewith, a second series of interfitting brake plates and brake discs positioned in axially spaced relation to said first series of clutch plates and discs, said brake discs mounted on said output shaft for rotation therewith and the interfitting said brake plates being supported for nonrotation by said housing, an annular actuating piston supported within said housing coaxial with said output shaft and for nonrotating axial movement, means connected to said piston for applying an axially compressive force to said first series of clutch plates and discs in response to movement of said piston in one axial direction to couple said input shaft with said output shaft, and means for applying an axially compressive force to said second series of brake plates and discs in response to movement of said piston in the other axial direction for braking said output shaft to said housing, the improvement comprising an oil pump impeller on said output shaft and including vane means extending through said first series of clutch plates and discs and second series of brake plates and discs for supplying oil under pressure to said plates and discs upon rotation of said output shaft, said impeller having an inlet located generally between said second series of brake plates and discs and said second end portion of said housing, and means defining a passage for directing oil within said housing to said inlet of said impeller.

3,924,716
VISCOUS FLUID CLUTCH WITH CENTRIFUGAL CLUTCH

Robert W. Brewer, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 21, 1973, Ser. No. 417,751
Int. Cl. F16d *25/00*, *43/18*, *43/30*
U.S. Cl. 192—57 5 Claims



1. A viscous fluid clutch comprising external and internal relatively rotatable drive means, said external drive means being rotatably mounted by bearings on a central shaft extending into said external drive means and having first and second adjacent annular chambers formed therein, said internal drive means having a hub secured to the inner end of said central shaft and extending radially outwardly therefrom into said first annular chamber, a plurality of annular ridges formed on one of said external and internal drive means and a plurality of cooperating annular grooves formed on the other of said external and internal drive means in said first annular chamber, said annular ridges and grooves forming a shear space therebetween and operable with a fluid medium to provide a shear-type fluid drive between said external and internal drive means, a centrifugal clutch operatively connected in said second annular chamber between said external drive means and said hub of said internal drive means, said centrifugal clutch including flange means secured to said external drive means at the radial outer wall surface of said second annular chamber, a pair of oppositely disposed arcuate-shaped centrifugal weights pivotally mounted on said flange means, a clutch shoe secured to the inner peripheral surface of each of said centrifugal weights, and spring means operatively connected between said oppositely disposed centrifugal weights for urging said clutch shoes into contact with said hub of said internal drive means.

3,924,717

FLUID ACTUATED CLUTCH

Takashi Ookubo, Yokohama, and Hideo Hamada, Yokosuka, both of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

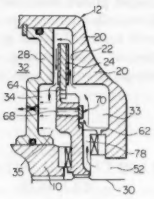
Filed July 25, 1973, Ser. No. 382,290

Claims priority, application Japan, July 26, 1972, 47-74781

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] F16D *25/063*

U.S. Cl. 192—86 **6 Claims**



1. A clutch assembly comprising:

a rotatable clutch drum;

a fluid pressure responsive pressure plate defining with said clutch drum first and second chambers which are adapted to receive fluid under pressure selectively;

a drive friction disc fixed to said clutch drum and exposed to said second chamber;

a clutch hub rotatable within said second chamber;

a driven friction disc splined to said clutch hub, said driven friction disc being movable toward said drive friction disc to engage with said drive friction disc in response to pressure in said first chamber, and away from said drive friction disc to disengage from said drive friction disc in response to pressure in said second chamber, said clutch hub and said driven friction disc dividing said second chamber into a first sub-chamber adjacent to said drive friction disc and a second sub-chamber adjacent to said pressure plate, said first and second sub-chambers being on axially opposite sides of the hub and disc assembly;

said pressure plate having formed therethrough at least one passageway for permitting fluid communication between said first chamber and said second subchamber;

said clutch hub having formed therethrough at least one hole for permitting fluid communication between said first and second sub-chambers;

a valve for permitting fluid to flow from said second to said first sub-chamber through said at least one hole, but preventing fluid from flowing from said first to said second sub-chamber through said at least one hole.

3,924,718

ADJUSTABLE SUPPORT

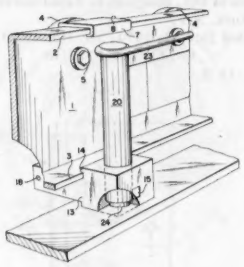
Andrew T. Kornylak, Hamilton, Ohio, assignor to Kornylak Corporation, Hamilton, Ohio

Filed June 3, 1974, Ser. No. 475,936

Int. Cl.[2] B65G *13/12, 41/00*

U.S. Cl. 193—35 R **11 Claims**

8. An adjustable support for selectively varying the spacing between a member to be supported and a support surface, comprising: an elongated rod having one end for engaging said support surface; handle means for rotating said rod about its longitudinal axis; said handle means being an elongated bar having one end bent circumferentially around and secured to the upper end of said rod and the other end extending transversely from said rod; a plurality of rack teeth on only one side of said rod and being generally uniformly longitudinally spaced along said one side of said rod; a bracket body having a through aperture longitudinally receiving therein said rod; means for releasably attaching said bracket body rigidly to the member to the supported; and detent means within said bracket body for engaging at least an adjacent one of said rack teeth in one position of said rod and being completely out of engagement with said rack teeth in another rotated position of



said rod to prevent relative movement between said rod and bracket body in the engaged one position and to allow free longitudinal relative movement between said rod and said bracket body in said disengaged another position.

3,924,719

VENDING MACHINE ELECTRICAL OPERATING CONTROL CIRCUIT

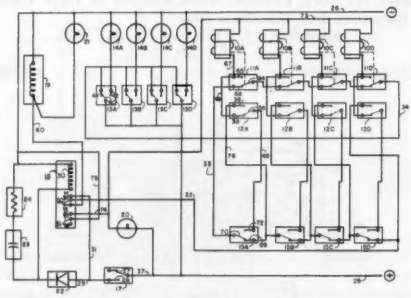
Raymond D. Bowman, Ringgold, Ga., assignor to Cavalier Corporation, Chattanooga, Tenn.

Filed Feb. 21, 1973, Ser. No. 334,251

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] G07F *11/00*

U.S. Cl. 194—10 **24 Claims**



1. An electrical control circuit for a coin operated vending machine incorporating a plurality of dispensing columns each adapted to receive articles to be selectively dispensed, comprising: a coin responsive vend switch; a vend relay responsive to actuation of said vend switch; a plurality of selector switches, each said selector switch being associated with an individual one of said columns; a plurality of dispensing actuators each being associated with an individual one of said columns and being responsive to actuation of one of said selector switches from a first to a second position and energization of said vend relay; and a plurality of control switching means each being associated with an individual one of said columns and being responsive to an individual one of said dispensing actuators, said switching means having a first position for mutually exclusively completing a first enabling circuit including each said selector switches for maintaining said vend relay energized when selector switches are all maintained in their first position and a second position for completing an energizing circuit to each one of said plurality of dispensing actuators

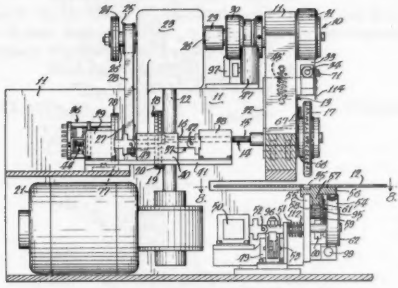
for selectively dispensing a single article upon actuation of a selector switch to its second position.

3,924,720

INDEXING TABLE ADVANCE MECHANISM

Ralph T. Wuetig, Dolton, Ill., assignor to Signode Corporation, Glenview, Ill.

Filed July 12, 1974, Ser. No. 488,246
Int. Cl.² B41J *1/22*
U.S. Cl. 197—6.5 **7 Claims**



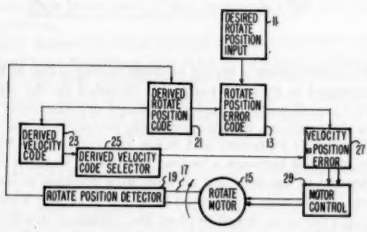
1. An indexing table advance means which comprises a frame; slide means on said frame and supporting an indexing table; rack means mounted on said slide means; pinion means rotatably mounted on said frame and engaging said rack means; escapement wheel means integral with said pinion means; cam means having a pair of spaced substantially parallel detent faces positioned for alternate engagement with a tooth on said escapement wheel means; spacing solenoid means linked to said cam means for axially shifting said cam means so as to alternately engage said detent faces with a tooth on said escapement wheel; release solenoid means linked to said cam means for pivoting said cam means so as to move both of said detent faces out of engagement with said escapement wheel; and negator spring means mounted on said frame and associated with said slide means for applying a substantially constant pull on said slide means and urging a tooth on said escapement wheel against one of said detent faces.

3,924,721

DIGITAL LOGIC AND SERVO SYSTEM FOR PRINT HEAD ROTATE CONTROL

Robert J. Reynolds, Ann Arbor, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Oct. 11, 1974, Ser. No. 514,133
Int. Cl.² B41J *7/34*
U.S. Cl. 197—18 **10 Claims**



1. A digital logic and servo system for controlled rotation of a servo motor to a desired rotate position, said servo motor being driven by a motor control circuit in response to a first logical indication of drive current direction, and said servo motor being dynamically braked by said motor control circuit in response to a second logical indication of drive current direction, said logic and servo system comprising:

means for receiving an input code representative of said desired rotate position;

means for detecting the present rotate position of said servo motor;

means responsive to said detecting means for generating a present rotate position code;

means responsive to said present rotate position code generating means for deriving a rotate velocity code from said generated rotate position code;

means responsive to both said receiving means and said generating means for computing a rotate position error code; and

means for comparing said derived rotate velocity code and said computed rotate position error code to provide first and second logical indications of drive current direction for precisely conforming the velocity of the rotate motor to an optimized velocity profile.

10. In a serial printer, a method for controlling the direction of drive current output from a servo motor driver responsive to drive current direction commands for either driving or dynamically braking a servo motor in conformity with a predetermined optimized velocity profile, said servo motor operatively coupled to a single element print head for rotating the single element print head to a desired rotate position, corresponding to a desired print head character column, comprising the steps of:

receiving a binary coded representation of said desired print head character column;

detecting the present rotate position of said servo motor;

generating a binary coded representation of said detected present rotate position;

calculating the difference between said binary coded representation of the desired print head character column and said generated binary coded representation of the present rotate position;

deriving a binary coded representation of servo motor rotate velocity from said generated binary coded representation of present rotate position;

comparing said derived binary coded representation of servo motor rotate velocity with said calculated difference to determine the drive current direction required to conform said servo motor to said optimized velocity profile; and

commanding said servo motor driver to provide drive current to the servo motor in said determined direction.

3,924,722

TYPEWRITER WITH ELECTRONIC KEYBOARD

James L. Wienhold, Minneapolis, Minn., assignor to CPT Corporation, Minneapolis, Minn.

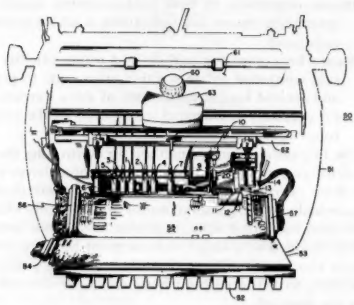
Filed Feb. 27, 1973, Ser. No. 336,240
Int. Cl.² B41J *5/30*
U.S. Cl. 197—19 **18 Claims**

1. A typewriter having an operating mechanism and a printing mechanism using a single element print head operable to present one character at a time to a printing position and print the same where the character is determined by tilt and rotational movement in response to distinct typewriter keyboard characters and operations, said typewriter operating and printing mechanism comprising:

a. electrical matrix means having components interconnected to be representative of said distinct typewriter keyboard characters and operations, and producing output signals representative thereof;

b. switch means including electrical power means electrically connected to said electrical matrix means and disposed in a typewriter keyboard pattern representative of the distinct typewriter characters and operations;

c. keyboard buffer means having its input excited by said electrical matrix means for storing and releasing said signals representative of said keyboard characters and operations, said buffer means having a high speed input and a slow speed output characteristic;
d. solenoid drive means operatively interconnected to said keyboard buffer means, said solenoid drive means being actuated in accordance with the characters and operations of the typewriter selected by an operator;
e. buffer control means electrically interconnected to said electrical matrix means and said keyboard buffer means and controlling the flow of signals to said solenoid driver means;



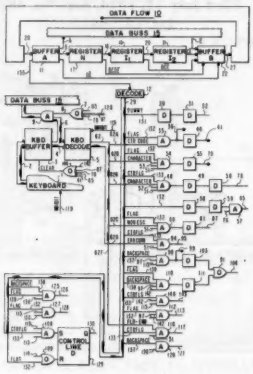
f. first timing means interconnected with said buffer control means and said solenoid drive means for inhibiting said keyboard buffer means while said solenoid drive means is energized;
g. second timing means interconnected with said buffer control means and said keyboard buffer means for inhibiting said keyboard buffer means during a predetermined rest period;
h. and printing cycle timing means operably interconnected to said printing mechanism and said second timing means providing a signal cutting off the operation of said second timing means prior to the end of said predetermined rest period.

3,924,723
CENTERING OF TEXTUAL CHARACTER FIELDS ABOUT A POINT

Donald Walter Cooper, and James Bradley Unruh, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1973, Ser. No. 428,542
Int. Cl.² B41J *5/30*
U.S. Cl. 197—19 **14 Claims**

1. A system for arranging and storing a sequence of textural codes upon input of said codes into a recirculating memory having an operation flag code defining an operating point therein, said codes being arranged and stored in said memory to facilitate centering of said codes about a chosen point when said codes are output to a printer, said system comprising:
first means for generating textural character codes and one or more escapement control codes capable of causing printer escapement to said chosen point;
second means for generating backspace codes;
escapement control code input means for inputting said one or more escapement control codes into said memory preceding said operation flag code;
textual character input means for inputting each textual character code generated by said first means into said memory immediately preceding said operation flag code; and
backspace input means for inputting a backspace code into said memory in response to the generation of every other escaping textual code, said backspace codes being input into said memory preceding the first entered textual character code and succeeding said one or more escapement control codes;

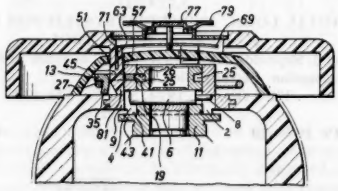


said character input means and said backspace input means cooperating with said first and second generating means and said memory for causing the storage in said memory of a contiguous stream of textural character codes, preceded by a contiguous stream of backspace codes, preceded by one or more escapement control codes.

3,924,724
STRUCTURE FOR FACILITATING INTERCHANGE OF TYPING ELEMENTS

Gunter Kerzel, Middelsfahr, Germany, assignor to Olympia Werke AG, Wilhelmshaven, Germany

Filed Mar. 19, 1975, Ser. No. 560,085
Claims priority, application Germany, Mar. 23, 1974, 2414127
Int. Cl.² B41J *1/60*
U.S. Cl. 197—52 **6 Claims**



1. In combination: a typing element having a cap at its top and arranged to be interchangeably installed on the element post of a typing machine and to be stored in a container when not on the machine, the element being provided, in the vicinity of its upper extremity and below the cap, with a locking device movable between a locking position in which it fastens the element to the post and an unlocking position in which it permits the element to be lifted from the post; and a member defining a cover arranged to close the container in a hermetically sealed manner, wherein the improvement comprises: detent coupling means arranged to selectively connect said cover to said cap for permitting said typing element to be moved as a unit with said cover; spring means normally main-

taining said detent coupling means in the position for creating such connection between said cover and said cap; and latch means carried by said cover for holding said locking means in said unlocking position when said cover is connected to said cap and for enabling said locking device to move to said locking position when said cover is separated from said cap.

3,924,725

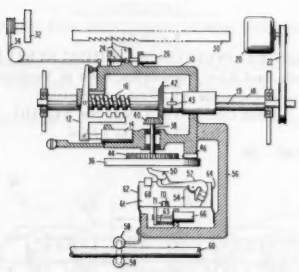
DUAL ARRAY DISC PRINTER

Robert F. Kuhn, Montrose, Pa.; Theodore F. Lyons, and Jerry W. Raider, both of Endicott, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 28, 1974, Ser. No. 484,022

Int. Cl.[2] B41J *1/32*

U.S. Cl. 197—53 **9 Claims**



1. The combination in printing apparatus of a carrier having drive means operable to move said carrier past a plurality of print column positions along the print line of a document upon which a printing operation is to be performed,

a rotating print wheel mounted on said carrier having an array of type characters of one group thereon around one portion of the periphery of the wheel and another array of type characters of a different group around another portion of the periphery of the print wheel, said print wheel having means to rotate said print wheel to present said type characters of both groups to each print column position,

a print hammer carried by said carrier operable to impact said type characters and print in said print column positions on said document, and

means to detect when the required printing changes from one selected print group to the other selected print group and to inhibit printing from two timewise adjacent groups, and

means selectively operable to provide additional movement of said print hammer along said print line less than one of said print column positions in accordance with which group of type characters is positioned to print in a print column position so as to cause said hammer to be more nearly centered in the appropriate column position when said selected print group is in print column position in front of the hammer.

3,924,726

TYPEHEAD SUPPORT FOR A SINGLE ELEMENT PRINTER

Herbert Decker, Lauf, Germany, assignor to Triumph Werke Nurnberg A.G., Nurnberg, Germany

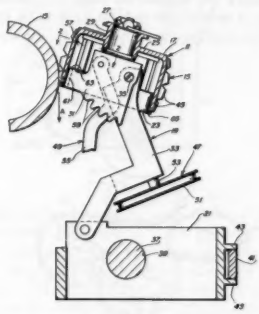
Filed Apr. 12, 1973, Ser. No. 350,523

Claims priority, application Germany, Apr. 15, 1972, 2218310

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] B41J *7/08*

U.S. Cl. 197—55 **4 Claims**



1. In a single element printer comprising

a hollow inverted cup shaped typehead having type characters on its outer periphery located in rows and columns, a platen,

a support member axially supporting said typehead for rotational movement to position a selected column of type characters opposite said platen,

support means pivotally supporting said support member for tilting movement to position a selected row of type characters opposite said platen,

said support means being movable from a rest position to a printing position to impact a selected type character against said platen,

said typehead on impact experiencing deformation with the lower portion tending to move tangentially relative to said platen and support member,

said lower portion of said typehead having edge defining means located in a radial plane,

and said support member having a radially extending abutment located opposite said platen and located closely beneath said edge defining means for arresting tangential movement of said typehead relative to said platen and said support member on impact of a selected type character against said platen.

3,924,727

CARTRIDGE WITH RESILIENT CONNECTING MEANS

Joseph L. Morelli, Hartford, Conn., assignor to Litton Business Systems, Inc., New York, N.Y.

Filed Feb. 2, 1973, Ser. No. 329,115

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] B41J *33/14*

U.S. Cl. 197—151 **1 Claim**

1. In a ribbon cartridge, the combination comprising:

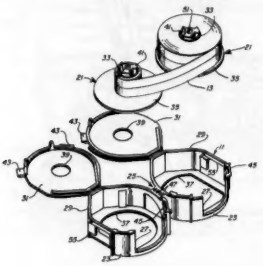
a pair of spool holders for rotatably supporting a pair of spool means having a ribbon secured therebetween and wound upon at least one of said pair of spool means,

said pair of spool holders each comprising an upwardly open container having a peripheral wall with at least a partial arcuate configuration and a ribbon opening formed therein for enabling the ribbon extending be-

tween said spool means to pass through the peripheral walls of said containers, a cover hingedly connected to a portion of each of said peripheral walls opposite said ribbon openings, and tab and slot means on said covers and walls for closing said containers,

said covers having a central opening defining an axis for rotation of each of the pair of spool means,

a plurality of resilient connectors extending in a horizontal plane between and joining in close proximity the arcuate portions of the peripheral walls of said pair of spool holders with the ribbon openings spaced circumferentially from said plurality of connectors and spaced apart from each other a distance substantially greater than the distance where the peripheral walls are connected by said plurality of connectors to form a gap to be spanned by the ribbon for enabling the ribbon to be drawn substantially



tangential between said pair of spool holders with the axis of rotation of the pair of spool means being in a common plane,

said plurality of connectors, said span of ribbon and said arcuate peripheral walls of said spool holders defining the boundaries of an area to allow access to a ribbon vibrator through which the span of ribbon is to be threaded,

each of said plurality of connectors having an intermediate portion of reduced cross-section capable of flexure for enabling said pair of spool holders to be manipulatively pivoted and twisted relative to each other with the axis for rotation of the pair of spool means being moved from the common plane to facilitate threading of the ribbon in a ribbon vibrator,

said plurality of connectors being rupturable at the intermediate portions of reduced cross-section after threading by moving said pair of spool holders from each other.

3,924,728

PRESSURE-ADHESIVE CORRECTION MATERIALS AND METHOD FOR PRODUCING SAME

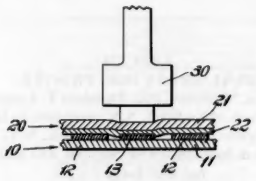
Albert E. Brown; Allan T. Schlotzhauer, and Douglas A. Newman, all of Glen Cove, N.Y., assignors to Columbia Ribbon and Carbon Manufacturing Co., Inc., Glen Cove, N.Y.

Continuation-in-part of Ser. No. 439,395, Feb. 4, 1974, abandoned. This application Nov. 22, 1974, Ser. No. 526,127

Int. Cl.[2] B41J *31/05*

U.S. Cl. 197—172 **24 Claims**

21. Process for the selective and complete removal of an erroneous typed image from a copy sheet having said image thereon in association with a multiplicity of other images typed from the same imagin g composition which comprises resinous binder material and pigment, said process comprising positioning over said images a latent adhesive correction element comprising a pressure-deformable foundation supporting a non-sticky latent adhesive layer which contains at least 10% by weight of an adhesive resin, which is pressure-flowable at ambient temperatures, and a non-adhesive surface material which provides a barrier stratum at said surface and renders said layer non-adhesive to the touch, and typing against the back of said foundation with a type face corresponding to the erroneous image to be removed and in a location corresponding to the position of said erroneous image to cause said latent adhesive correction element to be pressed against said erroneous image and to cause said adhesive resin to flow through said barrier layer and adhere to said erroneous



image, and separating said correction element from said copy sheet whereby said erroneous image remains adhered to the former and is stripped from the latter without the correction sheet adhering to or disturbing the other images on the copy sheet.

3,924,729

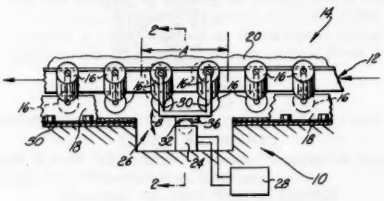
BELT CONVEYOR WEIGHING SYSTEM

Rune Flinth, and Kjell Nordström, both of Vasteras, Sweden, assignors to Conscale AB, Vasteras, Sweden

Filed Oct. 8, 1974, Ser. No. 513,101

Int. Cl.[2] G01G *11/04*

U.S. Cl. 198—39 **12 Claims**



1. Weighing apparatus comprising a movable conveyor adapted to carry material through a weighing station to be weighed thereat, a single load cell at said weighing station for providing a signal indicative of the weight of the material as it is conveyed by said conveyor, means interposed between said conveyor and said single load cell to transmit a force indicative of the weight of the material to the single load cell, said means interposed between said conveyor and said single load cell including means for enabling relative movement to occur between said conveyor and said single load cell in directions transverse to the direction of movement of said conveyor.

3,924,730

TWO MASS SWING SYSTEM WITH INDEPENDENTLY CONTROLLED VIBRATORY EXCITER MEANS

William R. Brown, Blairsville, Pa., assignor to FMC Corporation, San Jose, Calif.

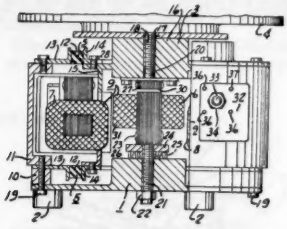
Filed Sept. 21, 1966, Ser. No. 581,058

Int. Cl. B65g *27/00*

U.S. Cl. 198—220 R **30 Claims**

1. A tuned two mass swing system including a base serving as a reaction mass and a feeder frame serving as a feeder mass supported from the base by elastic coupling means permitting independent horizontal and vertical components of vibration to be effective to swing said feeder frame in a controlled excursionary vibratory path of displacement for feeding materials, independent horizontal vibratory exciter means and independent vertical vibratory exciter means to independently

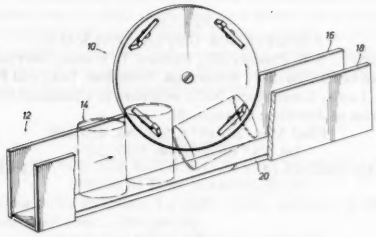
supply said horizontal and vertical components of vibration to said feeder frame, characterized by control means connected to independently and variably control said exciter means to independently change the magnitude of each of said horizontal and said vertical components of vibration and to independently and variably adjust the operating phase relationship between said horizontal and vertical components of vibration of said vibratory exciter means to regulate the action of the material moved on said feeder frame.



3,924,731
APPARATUS FOR RESTORING CANS TO UPRIGHT POSITIONS

James O. Meeks, 1606 32nd St., Nederland, Tex. 77627

Filed Nov. 15, 1974, Ser. No. 524,073
Int. Cl.² B65G 47/24
U.S. Cl. 198—268 11 Claims



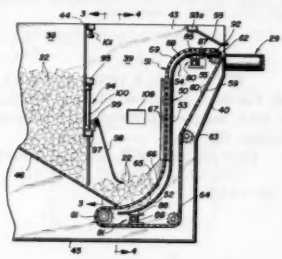
1. An apparatus cooperative with a conveyor system moving a procession of cans having a top lip or edge where the conveyor system confines the cans along a path of movement between a pair of sides spaced apart by a distance wider than the cans and where the conveyor bottom supports the cans in an upright position and the cans move along the conveyor system, and a can is liable to fall over and be pushed along the conveyor along with upright cans, wherein the apparatus comprises a movable means which supports a can lip engaging means located for movement along a path which hooks the lip of a fallen can supported on the conveyor system, said can lip engaging means being ineffective in hooking an upright can on the conveyor system, said movable means moving said can lip engaging means along a path which rotates the fallen can from the fallen position toward an upright position on the conveyor system.

11. An apparatus for cooperation with a conveyor system which transfers cans along a conveyor path defined by a pair of facing side walls where the cans are supported on a bottom and which comprises a means for supporting for circular movement a plurality of latch means which extend into the path of cans travelling on the conveyor system and which have a locus carrying them to a point of interception of the rim at the top or bottom of a fallen can on the conveyor system and which have a hook means for latching such a rim, and which hook means further does not latch on the exterior cylindrical surface of an upright can.

3,924,732
APPARATUS FOR UNSCRAMBLING AND ORIENTING OVERCAPS

George E. Leonard, Davenport, Iowa, assignor to The Kartridg Pak Co., Davenport, Iowa

Filed Nov. 19, 1973, Ser. No. 416,738
Int. Cl.² B65G 47/14
U.S. Cl. 198—287 7 Claims

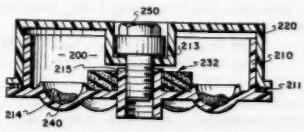


1. Apparatus for unscrambling and orienting can overcaps for placement onto cans, where each overcap is generally cylindrical in cross section, generally open at the bottom end and generally closed at the top end, of a diameter greater than the height, and constructed to have a center of gravity closer to one end than the other end, said apparatus comprising an unscrambling and orientation compartment for receiving a supply of overcaps, and unscrambling and orientation means in the compartment for engaging the overcaps at the bottom of the compartment, elevating and orienting the overcaps, and discharging the overcaps from the upper end of the compartment in a given oriented position, said unscrambling and orientation means including an upstanding slide having a lower section and an upper substantially vertical section and a set of pusher bars continually movable upwardly along the slide and in closer spaced relation therewith at the vertical section than at the lower section so as to push and lift overcaps from the compartment that are oriented such that their center of gravity is located between a pusher bar and the slide during movement along the substantially vertical section, and said slide including means for adjusting its position relative the pusher bars to accommodate overcaps of various heights.

3,924,733
METHOD AND APPARATUS FOR PRESERVING SOLVENT-DISPERSED CHEMICALS

Carol DeLong, 5938 Cahuenga Blvd., North Hollywood, Calif. 91601

Filed May 8, 1974, Ser. No. 468,067
Int. Cl.² B44D 3/00; B05C 17/00
U.S. Cl. 206—1.7 10 Claims



1. A palette for artists comprising:

a dished base having an interior paint receiving section formed on a bottom plate, said base including an upstanding wall integrally connected to said bottom plate adjacent the periphery of said bottom plate, said bottom plate being circular, a boss attached to said bottom plate and located within said paint receiving section, said boss being centrally located upon said bottom plate;

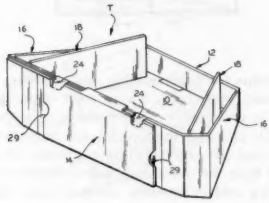
a circular shaped cover having a depending annular wall located at the periphery of said cover, an opening centrally located within said cover, a movable locking member extending through said opening, with said cover placed upon said base said upstanding wall of said base being located in a close proximity to and in an overlapping arrangement with said annular wall of said cover and said locking member being located within said boss, said locking member being movable to a locking position to secure said cover to said base.

3,924,734

EXPANDABLE DISPLAY TRAY

Jeffrey M. Gardner, Wheaton, Ill., and William M. Pilz, Eldridge, Iowa, assignors to Container Corporation of America, Chicago, Ill.

Filed Mar. 5, 1975, Ser. No. 555,697
Int. Cl.[2] B65D *5/52, 1/34, 5/20*
U.S. Cl. 206—44 R **5 Claims**



1. In an expandable shipping and display tray, formed of a unitary blank of foldable paperboard or the like, the combination of:

a. a bottom wall and opposed pairs of front and rear side walls and end walls foldably interconnected to form a box-like structure open at the top;

b. said side and end walls each including a pair of inner and outer panels;

c. at least one expansion member including:

i. a first flap interposed between the panels of an end wall;

ii. a second flap slidably interposed between the panels of a side wall for movement between a tray retracted position, wherein substantially all of said second flap is disposed within said side wall, and a tray expanded position, wherein only a distal portion of said second flap is positioned within said side wall;

d. lock means detachably interconnecting said second flap and said side wall when the former is in said tray expanded position.

3,924,735

SMOKING PIPE HOLDER

Luis G. Gonzalez, San Francisco, Calif., assignor to The Raymond Lee Organization, Inc., a part interest

Filed Dec. 13, 1974, Ser. No. 532,583
Int. Cl.[2] B65D *81/36, 25/10, 25/20*
U.S. Cl. 206—45.11 **2 Claims**

1. A pipe holder, comprising:

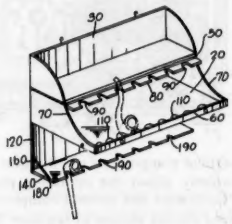
a hollow rectangular box with a horizontal floor and an opening in its top and front, the opening having straight top and bottom edges an forwardly and downwardly curving side edges;

a flat horizontal strip projecting forwardly from the top edge of the opening, and bearing a plurality of regularly spaced notches;

a lid hingedly secured to the top edge of the box, the lid being so shaped as to close off the box when the lid is closed into a hollow rectangular box that encloses the strip in its interior;

a rectangular flat first flap with front and rear edges, the first flap being hingedly secured at its rear edge to the floor of the box and extending downwardly and forwardly therefrom;

a rectangular flat second flap with front and rear edges, the second flap being hingedly secured at its rear edge to the



front edge of the first flap and bearing a plurality of regularly spaced notches along its front edge; and

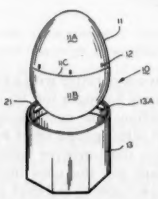
means having first and second states, the means supporting both flaps in a horizontal plane below the floor when in the first state and supporting the second flap in a horizontal plane when the first flap is hanging downwardly in a vertical plane, when the means is in the second state.

3,924,736

TAMPERPROOF DISPLAY PACKAGE

Richard L. Bell, Phoenixville; Richard T. Walter, Norristown, both of Pa.; David L. Botterman, Arlington, Tex., and Philip W. Lewis, Greensboro, N.C., assignors to Container Corporation of America, Chicago, Ill.

Filed Mar. 28, 1974, Ser. No. 455,856
Int. Cl.[2] B65D *3/04, 5/50, 5/54*
U.S. Cl. 206—45.14 **2 Claims**



1. A package comprising, in combination:

a. a spheroidal shaped article having extending around its girth a band of circumferentially spaced, aligned protuberances projecting therefrom;

b. a tamperproof carton, formed from a flat unitary blank of foldable paperboard, receiving and retaining a portion of said article;

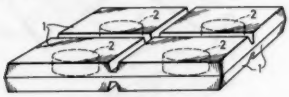
c. said carton including a generally cylindrical body wall defining a tubular structure open at its upper end and having at its lower end a plurality of closure flaps hingedly attached thereto and folded over and secured to each other in overlapped relation to close said lower end;

d. said body wall having at its upper end an inturned flange hingedly attached thereto and presenting a plurality of circumferentially spaced, aligned aperatures receiving said article protuberances to prevent the withdrawal of said article without rupturing said body wall.

3,924,737
STORAGE-STABLE MULTI-COMPONENT THERMOSETTING RESIN SYSTEM

Otto Ernst, Pfeffingen; Konrad Meyerhans, Therwil, and Eugen Kusenberg, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 27, 1974, Ser. No. 455,460
Claims priority, application Switzerland, Apr. 9, 1973, 5047/73
Int. Cl.² B65D *81/32*
U.S. Cl. 206—84 17 Claims

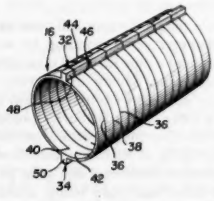


1. A storage-stable multi-component thermosetting resin system consisting of a moulding, possessing at least one closed cavity, of at least one component (A) of this multi-component system, the component being solid at room temperature, inert to atmospheric air and fusible through raising the temperature, and a filling of this cavity, comprising at least one solid or liquid reaction partner (B) of the component (A) for thermosetting resin crosslinking, preferably at temperatures above 20°C, with, optionally, both the component (A) and the component (B) or one of the two components containing customary additives to the mixture, such as fillers, plasticisers, dyestuffs and catalysts, accelerators and inhibitors of the curing reaction, and the ratio of the amounts of the component (A) to component (B) and optionally to the catalysts, accelerators and inhibitors in this multi-component system preferably being the same as in customary thermosetting resin processing of the particular corresponding mixtures.

3,924,738
MULTIPACKAGE DEVICE FOR CONTAINERS AND METHOD FOR MAKING SAME

Ouglesa Jules Poupitch, La Jolla, Calif., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Dec. 9, 1974, Ser. No. 530,537
Int. Cl.² B65D *85/62, 75/00, 71/02*
U.S. Cl. 206—150 19 Claims

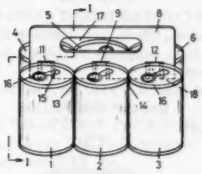


1. A carrier structure for a plurality of articles such as containers and the like comprising a series of carrier units disposed in end-to-end relationship and including ring portions for receiving articles to be carried, and hinge and spacer means interconnecting adjacent ring portions of adjacent carrier units in said series, each of said hinge and spacer means including a first rib element integral with one of said adjacent ring portions and a second rib element integral with the other of said adjacent ring portions, said first and second rib elements having an integral junction with each other, said junction being folded and providing a flexible hinge element between said carrier units.

3,924,739
METHOD OF BRINGING A PLURALITY OF CONTAINERS IN TRANSPORTABLE CONDITION BY MEANS OF A CARRIER MEMBER AND AN ASSEMBLY OBTAINED BY APPLICATION OF SAID METHOD

Elbert Gravesteijn, Abcoude, Netherlands, assignor to Heineken Technisch Beheer B.V., Rotterdam, Netherlands

Filed Apr. 9, 1973, Ser. No. 349,098
Claims priority, application Netherlands, Apr. 10, 1972, 7204768
Int. Cl.² B65D *75/00, 73/00*; B66C *1/10*
U.S. Cl. 206—157 2 Claims

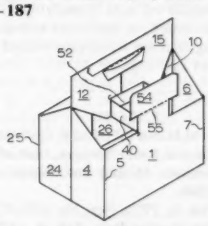


2. A transportable assembly of individual containers comprising an elongated handle consisting of a relatively rigid sheet of material having a finger receiving opening adjoining one elongated edge, at least two rows of circular containers with the containers of each row in substantial alignment, the other elongated edge portion of said material being disposed between said rows and means releasably bonding each of said containers to said handle portion disposed between said rows of containers, said sheet of material being folded upon itself to provide an upper portion of double thickness and a lower portion of single thickness with said upper portion having the finger receiving opening extending therethrough and said lower portion extending between rows of containers, said folded portion having an elongated edge bearing against the tops of the containers, the width of each of said slots being selected to cause corresponding containers of each row to [contact each other] at least partially enter and bear against the edges of said slots.

3,924,740
ARTICLE CARRIER

Prentice J. Wood, Jonesboro, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Dec. 2, 1974, Ser. No. 528,715
Int. Cl.² B65D *75/54*; G09F *3/00*
U.S. Cl. 206—187 8 Claims



1. An article carrier comprising a bottom wall, opposed side walls foldably joined to the side edges of said bottom wall, end wall panels foldably joined to the end edges of said side walls and extending inwardly therefrom, riser panels foldably joined to said end wall panels remote from said side walls and extending medially inward of the carrier, telescoping handle panels comprising a pair of inner handle panels respectively having a hand gripping aperture and a hand gripping slot and foldably joined respectively to the riser panels at one end of the carrier and a pair of outer handle panels respectively having a hand gripping aperture and a hand gripping slot and foldably joined respectively to the riser panels at the other end of the carrier, a promotional tab adjoined to the top edge of one of said side

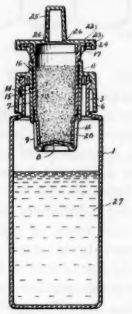
walls, the top edge of said promotional tab disposed at approximately the same level as the top edges of said hand gripping apertures and said hand gripping slots, a portion of said one side wall forming a high center portion to the top edge of which said promotional tab is adjoined, a transverse partition strap joined to each end of said high center portion and to one of said handle panels, and the length of said promotional tab being greater than the length of said high center portion by a distance substantially less than the length of one of said transverse partition straps.

3,924,741

TWO-COMPARTMENT CONTAINER

Nicholas W. Kachur, Clark, and Anthony F. Tomburo, Cranford, both of N.J., assignors to Gibson Associates Incorporated, Cranford, N.J.

Filed Mar. 4, 1975, Ser. No. 555,138
Int. Cl.² B65D *25/08*
U.S. Cl. 206—221 **5 Claims**



1. A two-compartment container comprising a bottle having a cylindrical neck, a stopper and capsule assembly mounted on said neck, said stopper and neck having interengaging means to secure said stopper to said neck, said stopper having a tubular sleeve extending downwardly through said neck and terminating in a transverse wall which closes the lower end of said sleeve, the lower portion of said sleeve adjacent said transverse wall having a plurality of apertures extending therethrough, said capsule comprising a tubular wall slidably mounted within said sleeve to move between upper and lower terminal positions, the lower portion of said tubular wall being adapted to close and seal apertures in the lower terminal position of said capsule and to open said apertures in the upper terminal position of said capsule, said tubular wall terminating in a rim which, in the lower terminal position of said capsule, seats against the transverse wall of said sleeve to seal the lower end of said capsule.

3,924,742

BOX FOR MAGNETIC TAPE CASSETTE

Fernando Primicerio, and Paolo Benigno, both of Naples, Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 6, 1974, Ser. No. 439,972
Claims priority, application Italy, Feb. 6, 1973, 35568/73
Int. Cl.² B65D *85/67, 43/14*
U.S. Cl. 206—387 **2 Claims**

1. Box for magnetic tape cassette comprising

a. a rectangular receptacle formed with

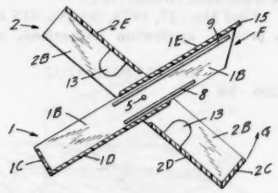
a pair of edge walls,

one end wall,

a partial face wall on one side of the receptacle extending from said end wall to the center of the receptacle, and a partial face wall on the opposite side of the receptacle extending from the center of the receptacle to the open end of the receptacle opposite said one end wall, into which open end a cassette may be inserted, and

b. a rectangular cover hinged to the center of the receptacle and having, when the box is closed,

a pair of edge walls which overlie the edge walls of the receptacle,



an end wall which closes the open end of the receptacle, and two parallel side walls, each of which abuts one of said partial face walls so that the closed box forms a rectangular parallelepiped, and

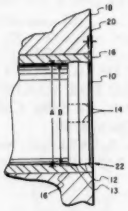
a lug projecting from the inner-facing surface of each side wall of the cover to lock the reels of an inserted cassette when the box is closed.

3,924,743

APPARATUS AND PROCESS FOR PLUGGING A PAPER ROLL CORE

Franklin C. Bittner, Star Route North, Box 560, Newport, Oreg. 97365

Filed July 8, 1974, Ser. No. 486,601
Int. Cl.² B65D *85/676;* **B23P** *19/02;* **B65H** *17/02*
U.S. Cl. 206—389 **15 Claims**



1. A deformable plugged paper roll core having a predetermined inside diameter corresponding to said core's undeformed condition, and a plug inserted coaxially within one end of said core, said plug having a generally double-tapered circular perimeter defined by a first portion of said plug having a diameter greater than said core's predetermined inside diameter and respective plug portions on either side of said first portion decreasing in diameter therefrom for deforming said core at a junction between said plug perimeter and the interior of said core, said plug being inserted in said core adjacent said end thereof at least to a sufficient depth that said first portion of said plug is recessed at a location entirely within said core spaced inwardly from said end expansively deforming said core at said recessed location, said core throughout that portion of said junction of said core and plug located outwardly of said recessed location having an inside diameter which is less than the expansively deformed inside diameter of said core at said recessed location.

15. The process of claim **12** wherein said shaping of said deformable core includes shaping the inside diameter of said core, throughout said outward portion of said junction of said core and plug, to decrease gradually in a direction toward said end of said core.

3,924,744
INDEX TAB SHEET

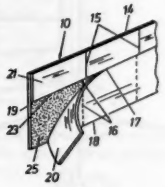
Egon Heimann, Falkenberg 61, D-56 Wuppertal-Elberfeld, Germany

Continuation-in-part of Ser. No. 97,463, Dec. 28, 1970, Pat. No. 3,747,242. This application July 11, 1973, Ser. No. 378,060

Claims priority, application Germany, Jan. 9, 1970, 2000798

Int. Cl.[2] B65D *73/00*

U.S. Cl. 206—460 **5 Claims**



1. An index tab sheet including an indefinite number of juxtaposed index tabs adapted to be attached individually to the margin of a card, comprising in combination:

a. a plurality of relatively stiff label portions arranged in a side-by-side relationship; each label portion having a face coated over its entire area with a pressure-sensitive adhesive; said face being divided into a first zone and a second zone;

b. a plurality of index portions, one attached to said face of each label portion over the entire area of said first zone in registry therewith; said index portions being arranged in a side-by-side relationship; and

c. a continuous supporting strip having a face provided with an adhesive repelling coating; said supporting strip being attached, with its adhesive repelling coating to said face of said label portions over the entire area of said second zones for firmly maintaining said label portions in their side-by-side position; said continuous supporting strip being adapted to be peeled off from successsive label portions to expose their second zones and permit their separation from the index tab sheet; each label portion being adapted to be individually attached by said second zone to said margin of said card subsequent to peeling off said supporting strip, whereby said first zone with said index portion thereon projects beyond said margin of said card and is firmly supported by the relative stiffness of said label portion.

3,924,745
PACKAGE CONSTRUCTION, PARTICULARLY A PACKAGE DESIGNED FOR A SINGLE USE

Ludwig Hannemann, Maximiliansau, and Manfred Horst Simon, Spessart, both of Germany, assignors to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft, Germany

Filed Feb. 20, 1974, Ser. No. 444,180

Claims priority, application Germany, Mar. 14, 1973, 2312549

Int. Cl.[2] B65D *73/00, 47/10*

U.S. Cl. 206—484 **6 Claims**

1. A package construction, particularly a package designed for a single use, comprising at least a single layer material having an interior cavity surrounded on all sides by said material forming a space to receive the filling and which is provided with means for opening the package, a hollow tubular body connected to the cavity for the passage of the filling material whose one part is surrounded fixedly in longitudinal direction by said material and whose other part is surrounded loosely in longitudinal direction by said material, the loosely surrounded part of said hollow body serving to open the package and the boundary of said material between the fixedly and the loosely

surrounded hollow body having tear-off area extending across the package defining a preset breaking point.

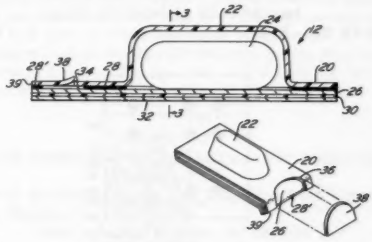
3,924,746
CHILDPROOF PACKAGE

Russell R. Haines, Cherry Hill, N.J., assignor to Paco Packaging, Inc., Pennsauken, N.J.

Continuation-in-part of Ser. No. 270,877, July 12, 1972, Pat. No. 3,835,995. This application Jan. 7, 1974, Ser. No. 431,276

Int. Cl.[2] B65D *83/04, 75/32*

U.S. Cl. 206—530 **7 Claims**



1. A package comprising a carrier layer of polymeric plastic having a rigid pocket formed therein and spaced from the edges thereof, said carrier layer being sealed opposite the open end of said pocket to a laminate except for an unsealed zone adjacent one end of said carrier layer, said carrier layer being slit at said zone to define a tab only on said carrier layer with the ends of the slit being adjacent to but spaced from said one end of the carrier layer by unslit portions, said tab having a width which is narrower than the width of said carrier layer, said laminate including a layer of material having high resistance to tearing, said unsealed zone being between first and second heat seals between the laminate and the carrier layer, said second heat seal being at said one end and narrower than the width of the unsealed zone while having a width corresponding generally to the width of said unslit portions, access to said pocket being attained by removal of the tab to expose the part of the laminate therebelow and then peeling the laminate with respect to said carrier layer to expose said pocket.

3,924,747
PACKAGING

Daniel F. Gerner, Blackwood, N.J., assignor to Packaging Coordinators, Inc., Philadelphia, Pa.

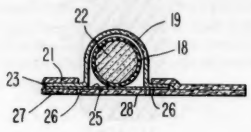
Filed Mar. 28, 1974, Ser. No. 455,615

Int. Cl.[2] B65D *83/04, 85/56*

U.S. Cl. 206—531 **14 Claims**

1. A blister card for child-proof packaging of medicaments in discrete capsule, lozenge, or pill form, comprising a non-rupturable transparent plastic strip having a plurality of blister-like protrusions therein outward from one face and leaving a corresponding plurality of hollows and openings thereinto at

the opposite face thereof, a rupturable foil strip adherent to the latter face of the plastic strip and sealing the openings therein, a supporting card portion including a first paper layer juxtaposed to the first face of the plastic strip and having one



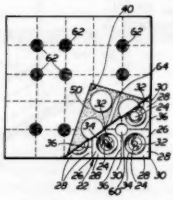
or more openings therein to accommodate the protrusions and including a second paper layer overlying the foil strip and the first paper layer and adherent thereto, the second paper layer having perforated a like plurality of individual access tabs in the parts thereof opposite the corresponding hollow openings.

3,924,748

CLOSURE FOR MULTICOMPARTMENT MEDICINAL DISPENSING DEVICE

Milton Braverman, 640 Wynmill Place, Philadelphia, Pa. 19115

Filed Apr. 11, 1974, Ser. No. 459,491
Int. Cl.[2] B65D *83/04, 85/56, 75/42*
U.S. Cl. 206—534.1 **7 Claims**



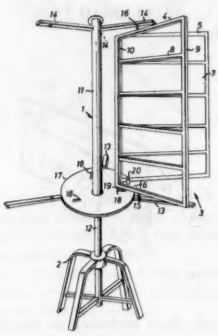
1. For use with a medicinal dispensing device including article holding means having a plurality of article holding units each with flanges having corners and being detachably connected along certain lines so that each unit may be separated by the remaining units, a chamber for holding an article therein depending from each flange and having an opening for said chamber, one corner of at least one flange of each unit being removed in cut-away area, improved closure means including a plurality of closures, each of which being co-extensive in size with each of the article holding units and adapted to seal the opening in a respective one of said units, said closure means comprising a cover sheet and a liner sheet, said cover sheet having an exterior surface and an interior surface having an adhesive thereon, said adhesive temporarily securing the liner sheet to the cover sheet, said cover sheet, when removed from said liner sheet, being disposed upon said article holding means with the adhesive on said cover sheet in contact with the flanges of said article holding means to secure the cover sheet to the article holding means, said cover sheet including plural perforated lines corresponding to the flange lines for forming the closures between said perforated lines, at least one portion of the interior surface of the cover sheet contiguous with one of said perforated lines and extending along said line on both sides thereof having no adhesive thereon such that one portion of each closure defined by said line includes a portion having no adhesive thereon, said non-adhesive interior surface portion being disposed directly over a cut-away area of the flange of the article holding unit when said cover sheet is secured in place to provide a convenient, non-adhesive tab for affecting the removal of the closure from the article holding unit to which it is secured.

3,924,749

DISPLAY DEVICE

Roy Bernard Weston, 9 Dingle Dell, Leighton Buzzard, England

Filed July 22, 1974, Ser. No. 490,604
Int. Cl.[2] E05B *73/00*
U.S. Cl. 211—4 **2 Claims**



1. A display device comprising a wing-like member in the form of a generally rectangular frame for receiving articles to be displayed; a supporting structure; a rotatable plate carried by said supporting structure; a slot in said rotatable plate; pivot means pivotally mounting said wing-like member about an axis substantially parallel to the plane of the wing-like member, with said axis intersection two oppositely disposed edges of the frame and being parallel to the other two edges of the frame; openings at one of said other edges of the frame through which the said articles can be inserted and removed; a blocking member; a pin extending from one of said oppositely disposed frame edges of said wing-like member at a region of said one edge located between said blocking member and said pivot axis, said pin extending into said slot; said rotatable plate, said slot and said pin constituting means for limiting the pivotable movement of said frame between one limiting position and another limiting position so that in said one limiting position the said openings are blocked by the said one frame edge being in the proximity of the blocking member, whereas in the other limiting position the said one frame edge is clear of the blocking member, thus rendering the articles free for removal; and locking means for fixing the frame in its said one limiting position.

3,924,750

EYEGLASS DISPLAY UNIT

Richard S. Dunchock, Northville, Mich., assignor to Optarac Corporation, Ferndale, Mich.

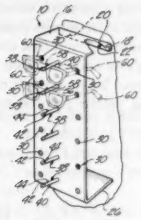
Filed Aug. 28, 1974, Ser. No. 501,178
Int. Cl.[2] A47F *7/02*
U.S. Cl. 211—13 **14 Claims**

1. A display unit for eyeglasses and the like, said display unit comprising:

a body panel having an integrally formed top flange extending behind said body panel for mounting said body panel to a vertical wall, said body panel having an integrally formed base flange extending behind said body panel for supporting said body panel in an upright position, said base flange being disposed in a plane which is inclined with respect to the plane within which said body panel is disposed, the perpendicular distance from the face of said body panel to the outer edge of said top flange being equal to the perpendicular distance from said body panel face to the outer edge of said base flange, whereby said body panel is disposed in a vertical plane when said top

flange outer edge is attached to said vertical wall and said base flange outer edge rests against said vertical wall;

said body panel having a plurality of vertically spaced pairs of opposed apertures; and



a plurality of eyeglass support elements carried by said body panel at vertically spaced locations between each pair of opposed apertures.

3,924,751

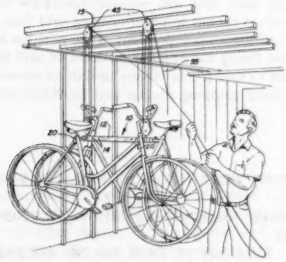
BIKE RACK HOIST

William G. Ballenger, Deerfield, Ill., assignor to Central Specialties Inc., Chicago, Ill.

Filed May 6, 1974, Ser. No. 466,872

Int. Cl.[2] A47F *5/08*

U.S. Cl. 211—17 **12 Claims**



1. A hoistable storage rack for carrying at least one bicycle thereon and permitting the hoisting of the rack on an overlying support, with at least one bicycle mounted thereon, comprising in combination,

a horizontally disposed support bar having front and rear surfaces,

a plurality of bicycle hooks mounted on the front surface of said support bar and extending forwardly outwardly therefrom,

a plurality of bicycle hooks mounted on the rear support surface of said support bar and extending rearwardly outwardly therefrom,

said support bar including a plurality of horizontally spaced and linearly aligned apertures disposed therethrough and adjacent each of the ends thereof, and each of said bicycle hooks including a threaded shaft, whereby each of said bicycle hooks may be mounted on said support bar by inserting said threaded shaft through one of said apertures and securely held in position by threaded nuts screwed threadily mounted thereon,

at least a pair of curvilinear hanging means, mounted on said support bar, one of said pair of hanging means mounted adjacent each end thereof and extending upwardly therefrom,

each of said hanging means having lower pulley means mounted thereon and extending upwardly therefrom,

the overlying support provided with opposed support hanging means fixedly secured thereto and extending downwardly therefrom,

each of said opposed hanging means having upper pulley means mounted thereon and extending downwardly therefrom,

said upper pulley means being positioned in spaced vertical alignment with respect to said lower pulley means,

said lower pulley means comprising a pair of fiddle blocks, each having a large pulley wheel and a smaller pulley wheel, said smaller pulley wheel being positioned above said larger pulley wheel, and said upper pulley means comprising a pair of second fiddle blocks, each having a larger pulley wheel and a smaller pulley wheel, said smaller pulley wheel being positioned below said larger pulley wheel,

rope means fixedly secured to each of said upper pulley means at the opposed ends of said rope means and having one end portion of said rope means interconnecting vertically opposed one of the said pairs of lower and upper pulley means, and the opposed end portion of said rope means interconnecting the other vertically opposed ones of said pairs of lower and upper pulley means,

and the central portion of said rope means positioned between said vertically opposed ones of said pairs of said lower and upper pulley means,

whereby retraction force applied against the central portion of said rope means will cause said vertically opposed ones of said pairs of lower and upper pulley means to work against each other, through said rope means, thereby to hoist said support bar upwardly with at least one bicycle mounted on and between respective bicycle hooks.

3,924,752

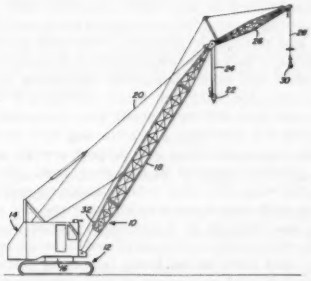
CRANE BOOM AND LINE SAFETY LIMIT WARNING ASSEMBLY

Frank M. Hoofnagle, Houma, La., assignor to BWB Controls, Inc., Houma, La.

Filed July 16, 1974, Ser. No. 489,041

Int. Cl.[2] B66C *13/48*

U.S. Cl. 212—39 MS **10 Claims**



2. In combination with a crane including first and second components with the first component movable relative to the second component in opposite directions toward and away from the second component and in one of said directions toward a predetermined limit position, an abutment portion on one of said components, a normally closed pressure relief valve on the other of said components and including an acutator engageable by said abutment portion upon movement of said first component in said one direction to a position adjacent said limit position to open said pressure relief valve, a source of pressurized gas, a fluid pressure system including a fluid pressure line having an inlet end adapted for connection to said source of gas under pressure and an outlet end, a branch line including an inlet end communicated with said pressure line and an outlet end, a pneumatically actuatable

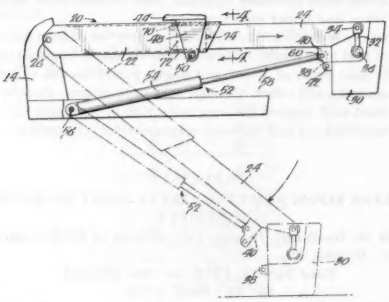
signalling device connected to the outlet end of said branch line, said branch line including a normally closed valve serially connected therein and to which the outlet end of said pressure line is connected and operable to open said valve in response to a drop in pressure at said inlet port caused by the opening of said pressure relief valve, air flow restricting means in said pressure line between the inlet end of said branch line and the outlet end of said pressure line, and a pressure relief line including an inlet end opening into said pressure line between its outlet end and said flow restricting means and an outlet end under the control of said pressure relief valve, further said source of pressurized gas operates said pneumatically actuactable signalling device.

3,924,753

CRANE COUNTERWEIGHT SUPPORT AND MEANS FOR REMOVING AND MOUNTING SAME

Gerald P. Lamer, Rothschild; Ronald L. Zyduck, Mosinee, both of Wis., and David F. Roesler, Edina, Minn., assignors to J. I. Case Company, Racine, Wis.

Filed Apr. 22, 1974, Ser. No. 462,978
Int. Cl.² B66C *23/72*
U.S. Cl. 212—48 **8 Claims**



5. In a crane having a base with an extensible and retractable boom supported on said base; a counterweight; a counterweight carriage having first and second elongated relatively extensible and retractable elements; horizontal pivot means supporting one of said elements for pivotal movement on said base; means on said other element for supporting said counterweight; extensible fluid ram means having one end connected to said base and an opposite end connected to said other element for extending and retracting said elements; a substantially horizontal elongated support arm on said base extending generally parallel to and above said one of said elements; and releasable latch means carried by said arm and cooperating with said counterweight carriage for normally supporting said carriage in a substantially fixed position on said base for horizontal movement of said elements relative to each other, said latch means being selectively releasable to accommodate pivotal movement of said counterweight carriage on said base so that said counterweight may be lowered by said extensible fluid ram means and removed from said base.

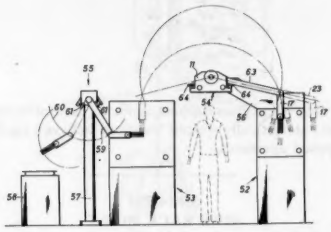
3,924,754

APPARATUS FOR TRANSPORTING WORKPIECES

Walter Reis, Obernburg, and Dietmar Boll, Elsenfeld, both of Germany, assignors to Walter Reis, Obernburg, Germany

Filed May 29, 1974, Ser. No. 474,333
Claims priority, application Austria, June 5, 1973, 4904/73; Germany, Apr. 26, 1974, 2420240
Int. Cl.² B25J *13/00*
U.S. Cl. 214—1 BD **9 Claims**

1. An arrangement for transporting workpieces from one operating station to another, comprising base frame means, guide means supported on said base frame means, carriage means supported on said guide means for movement substantially parallel to at least one of said operating stations, means for moving said carriage on said guide means, a transport arm having first and second ends, means journaling said first end of said transport arm to said carriage means for supporting said arm for rotation about a first axis substantially parallel to said one operating station, drive means positioned on said first axis and operatively coupled to said first end of said transport arm, a tilting arm having one end journaled to said second end of said transport arm about a second axis parallel to said first axis, workpiece gripping means pivoted to the other end of



said tilting arm, whereby a workpiece held by said gripping means is movable through an angle of more than 180° about said first axis, tilt control means for said gripping means comprising a first sprocket mounted coaxially on said first axis, a second sprocket affixed to said tilting arm coaxially at said second axis, said first and second sprockets having equal diameter, chain means interconnecting said first and second sprockets and means independent of the position of said transport arm for fixing the angular position of said first sprocket with respect to said frame means, and drive means coupled to said workpiece gripping means and mounted on said frame means.

3,924,755

FEEDING ARRANGEMENT FOR A BAR-SHAPED OBJECT

Herbert Stahl, Koenigsheimer Str. 12, D-7205 Boettingen, Germany

Filed July 15, 1974, Ser. No. 488,556
Int. Cl.² B65H *5/06*
U.S. Cl. 214—1 P **9 Claims**

1. A feeding arrangement for a bar-shaped object comprising:

a. a support, said support in the normal operating position of said arrangement having an upwardly directed face elongated in a horizontally extending direction, said face being adapted to carry said object for sliding movement of the object in said direction; and

b. two discs mounted on said support for rotation in respective planes about respective axes passing through said support below said face in said condition of the arrangement,

1. said discs being oppositely offset from said face transverse to the direction of elongation of said face, and

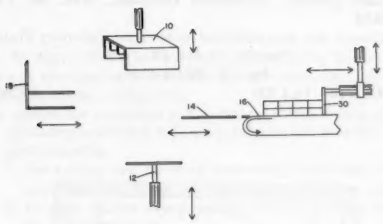
2. said planes converging in an upward direction and in the direction of elongation of said face.

3,924,756

APPARATUS FOR STACKING BRICKS IN PREPARATION FOR STRAPPING

William F. Milholen, Siler City, and Cletus E. Lineberry, Staley, both of N.C., assignors to Forrest Paschal Machinery Co., Siler City, N.C.

Filed May 14, 1974, Ser. No. 469,649
Int. Cl.[2] B65G 57/26
U.S. Cl. 214—6 A 7 Claims



1. In combination with a brick stacking device of the type wherein separate and distinct courses of bricks having a plurality of rows therein are transferred sequentially from a conveyor to an elevating device to build a stack of courses to a prescribed height, the apparatus comprising:

a. a receiving plate movable between a first position above said elevating device and a second, laterally spaced position removed therefrom;

b. a transfer means for sequentially slidably moving said courses from said conveyor to said receiving plate;

c. a vertically movable gripper apparatus at said first position above said receiving plate for engaging and holding one of said courses as said receiving plate is moved to said second position;

d. said elevating device being movable between an upper position under-lying said one course held by said gripping apparatus and one of several pre-selected lower positions;

e. a tyne building means selectively positionable between said gripper apparatus and said elevating device during selected cycles of said gripper apparatus for separating the tyne bricks from the other bricks of a selected layer, said gripper apparatus lifting a single uppermost layer from a position above said elevating device and returning said other bricks of said layer to said stack after the tyne bricks are removed by said tyne building means;

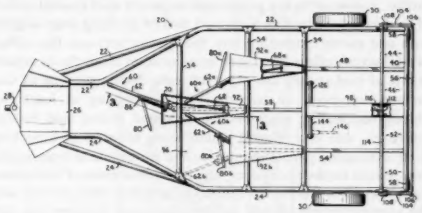
f. whereby as said receiving plate is moved to the second position, said gripping apparatus holds said courses until the elevating device is raised to receive the courses, and said courses are deposited on said elevating device with a minimum of movement and without lateral movement, resulting in a stack having tyne openings therein and with the headers thereof aligned and even.

3,924,757

BALE ACCUMULATOR

Frank A. Meyer, R.R. No. 3, Herington, Kans. 67449

Continuation of Ser. No. 283,902, Aug. 28, 1972, abandoned.
This application June 24, 1974, Ser. No. 482,586
Int. Cl.[2] A01D 87/12; B65G 57/32
U.S. Cl. 214—6 B 4 Claims



1. In a bale accumulator employing a carrier adapted for movement over the ground, where the carrier is divided into a plurality of bale-receiving chutes extending in parallelism in the direction of movement thereof, bale guide structure on the carrier for loading the chutes with successively received bales and including a bale guide gate for directing bales successively received by the gate in alternate directions, said gate comprising:

a blocking member mounted for swinging movement about a first upright axis between a pair of operating positions corresponding to said directions;

an over-center mechanism coupled with said blocking member for biasing the latter toward either one or the other of said positions,

said mechanism including a rotatable element mounted on said blocking member for back and forth movement about a second upright axis spaced from said first axis, and yieldable means having a movable connection with said element and applying force thereto to effect said biasing of the blocking member; and

an actuating arm coupled with said element and extending from said blocking member for engagement by a transient bale,

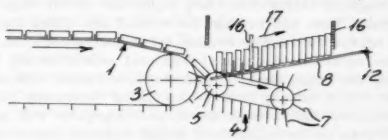
said arm being responsive to said engagement by a transient bale for rotating said element to change the line of action of said yieldable means to cause the blocking member to change positions.

3,924,758

APPARATUS FOR STACKING OBLONG ARTICLES

Hans Gram, Vojens, Denmark, assignor to Brodrene Gram A/A, Vojens, Denmark

Filed June 4, 1974, Ser. No. 476,292
Claims priority, application Denmark, June 8, 1973, 3194/73
Int. Cl.[2] B65G 57/18
U.S. Cl. 214—7 1 Claim



1. An apparatus for stacking oblong articles, each having a generally rectangular cross-sectional shape, comprising: a supply conveyor for the conveyance of a succession of articles to be stacked, said supply conveyor being divided into com-

partments by pushing dogs, said compartments having a width sufficient for accommodating said articles lying on their broader sides, said supply conveyor passing around a set of spaced rollers; a further conveyor divided into compartments by pushing dogs, the compartments of said further conveyor having a width sufficient for accommodating said articles standing on their smaller sides, the pushing dogs of said further conveyor being divided into sets and one end of said further conveyor being positioned adjacent said spaced rollers of said supply conveyor with said sets of pushing dogs aligned with and partly extending into the spaces between the rollers of said set of rollers for transferring articles from the compartments of said supply conveyor into the compartments of said further conveyor; an accumulator comprising at least two oblong supporting plates being arranged above said further conveyor, one end of said plates being secured to a rocking shaft extending perpendicular to the direction of transportation of said further conveyor, the other free ends of said plates being movable from a first position in which they extend into the compartments of said further conveyor between the sets of pushing dogs of said further conveyor for accumulating a group of articles transferred from said further conveyor and onto said plates, and to a second position in which said free ends are pivoted up over the compartments of said further conveyor, said accumulator, moreover, comprising at least two supporting ribs of which at least one being movable above said supporting plates in the second position thereof and in the longitudinal direction of said supporting plates for further transportation of said accumulated group.

3,924,759

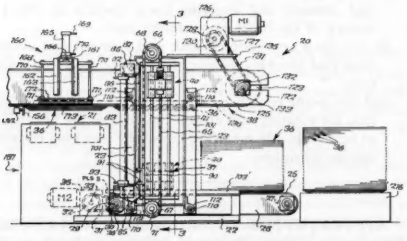
ARTICLE PICK-UP AND TRANSFER APPARATUS

Anthony F. Madonia, 19 Middlebury Lane, Buffalo, N.Y. 14216

Division of Ser. No. 290,269, Sept. 18, 1972. This application Feb. 11, 1974, Ser. No. 441,109

Int. Cl.[2] B65G *59/04*

U.S. Cl. 214—8.5 D **12 Claims**



1. An article transfer apparatus comprising in combination: means for supporting a stack of articles; carriage means mounted in substantial vertical registry with said stack of articles; means for moving said carriage means toward and away from said article supporting means; magnetic means on said carriage means for engaging a single article on said stack; said magnetic means comprising a plurality of bar magnets suspended from said carriage for vertical and tilting movement relative thereto whereby said bar magnets are self orienting for optimum engagement with said article; means for sensing the engagement of said magnetic means with said articles; said sensing means comprising a sensing plate mounted on said carriage means and engagable with said article prior to the engagement of said magnetic means with said article, said sensing plate mounted on said carriage means for movement relative thereto, and switch means on said carriage means activated by movement of said sensing plate relative to said carriage means for energizing said control means, control means responsive to said sensing means for interrupting downward movement of said carriage means upon engagement of said magnetic means with said article and initiating upward movement of said carriage means to lift said magnetic means and remove a single article from said stack; a transfer conveyor mounting in overlying relation to said carriage means for receiving said article therefrom as said carriage means approaches the end of its upward movement; means for advancing and transfer conveyor to move said article to a discharge station; said control means including an electric interlock preventing actuation of said carriage moving means until said article is moved away from the receiving portion of said transfer conveyor; and means at said discharge station for stripping said article from said conveyor onto an output station, said stripping means comprising a pusher element and means for moving said pusher element relative to said transfer conveyor and into engagement with said article for removing said article from said transfer conveyor.

3,924,760

CAR GARAGE

Ulrich Lendi, Stafa, Switzerland, assignor to Firma Mageba, Bulach, Switzerland

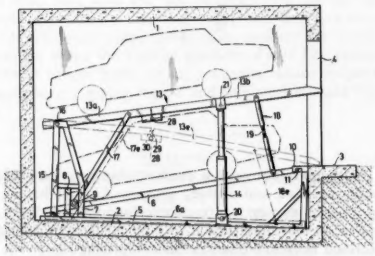
Filed Mar. 6, 1974, Ser. No. 448,571

Claims priority, application Germany, Mar. 20, 1973, 2313695

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] E04H *6/06*

U.S. Cl. 214—16.1 ED **6 Claims**



1. A garage for parking two vehicles one above the other comprising a garage box parking area having an entrance opening providing access thereto, an entrance floor, a garage box floor located at a lower level than said entrance floor, allowing said parking area to be disposed in a recessed position relative to the garage entrance; upper and lower parking platforms, each operative to accommodate a vehicle, whose outer ends are optionally joinable with the garage entrance; a longitudinally spaced pair of rigid rods laterally connecting said platforms, on each side, with their upper and lower ends articulated to the upper and lower platforms respectively; a stationary support on which the inner end of said upper platform is pivotally mounted for movement about a horizontal axis; and a vertically disposed guide for said lower platform rising from the garage floor; wherein said upper platform is composed of two hingedly connected sections, with the inner section being pivotally connected to said stationary support and the outer section being joinable with the garage entrance and said longitudinally spaced connecting rods are articulated at their upper ends to said upper platform's inner and outer sections respectively.

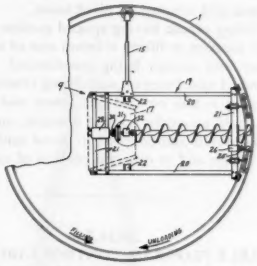
3,924,761
HORIZONTAL ROTARY SWEEPS FOR FEED STORAGE TANKS

Charles F. Lambert, Jr., Louisville, Ky., assignor to Clayton & Lambert Manufacturing Company, Buckner, Ky.

Continuation-in-part of Ser. No. 416,680, Nov. 16, 1973, abandoned. This application Jan. 20, 1975, Ser. No. 542,222

Int. Cl.[2] B65G *65/32, 65/38*

U.S. Cl. 214—17 CB **2 Claims**



1. An apparatus for use in filling and unloading feed storage tanks or silos having a vertically movable non-rotatable supporting assembly, comprising:

A. means for mounting a horizontaal rotary sweep of the spreading/unloading type on said vertically movable support assembly

1. for raising and lowering movement therewith during respective silo filling and unloading operations and

2. for slow relative sweep rotation about a vertical axis of the assembly;

B. sweep drive means for slowly rotating the sweep during said filling and unloading operations;

C. means for mounting an auger on said sweep to depend therefrom in concentric relation to said vertical axis; and

D. auger drive means for rapidly rotating said depending auger

1. one way, during a silo-filling sweep-rising operation, to render it operative to function as a cylindrical barrier which prevents the incoming silage from lodging within the cylindrical space of the barrier so that said incoming silage builds up a column around said barrier and thus forms a vertical-open-ended silge-discharge hole extending progressively upward from the bottom of the progressively rising column of silage as the rising rotary sweep spreads the incoming silage over the top of the column.

3,924,762
APPARATUS FOR CONVEYING AND STORING YARN PACKAGES OR PIRNS

Wolfgang Igel, Ebersbach, Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach, Germany

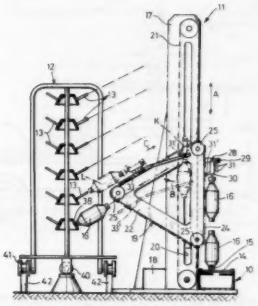
Filed Sept. 20, 1974, Ser. No. 507,862

Claims priority, application Germany, Sept. 24, 1973, 2347926

Int. Cl.[2] A01D *90/00;* **D01H** *13/26*

U.S. Cl. 214—38 B **6 Claims**

1. In an apparatus for transporting and storing a plurality of wound yarn packages, the apparatus including a conveying device of a textile machine on which the yarn packages can be arranged at spaced intervals from one another, the packages being conveyed by the conveying device to a transfer device which transfers them to a transportable storage unit including a plurality of holders for holding wound yarn packages at spaced intervals from one another, the transfer device operating cyclically and upon each cycle gripping by gripper means at least one yarn package which has been brought to the transfer device by the conveying device and which transfers the yarn package to a holder of the storage unit by displacing the gripper means, and control means for automatically controlling the transfer, the improvement comprising, as part of said storage unit, a plurality of rows of said holders which are arranged at different levels with their longitudinal axes inclined with respect to the vertical, and as part of said transfer device, means for both adjusting vertically and moving downwardly said gripper means towards said holders of said storage unit in an obliquely inclined direction to the vertical, this vertically inclined direction of movement corresponding to the inclination of the longitudinal axes of said holders of said storge unit.



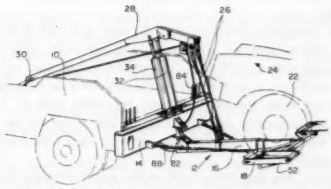
3,924,763
VEHICLE TOWING DEVICE

Norbert G. Pigeon, Ste-Madeleine, Ste-Hyacinthe, Quebec, Canada

Filed Nov. 14, 1974, Ser. No. 523,660

Int. Cl.[2] B60P *3/12*

U.S. Cl. 214—86 A **10 Claims**



1. A vehicle towing device adapted to be mounted at the rear of a truck for towing a vehicle, the said device comprising;

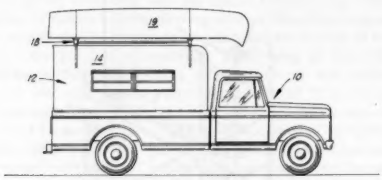
an extensible beam projecting rearwardly from the vehicle and pivotally mounted therefrom along a vertical plane, a cross-bar fixed at the free end of said beam in a horizontal position,

a shallow trough-like member having a rigid peripheral frame adapted to receive a segment of the tires of the wheels of the towed vehicle, the said frame being secured to said cross-bar so that the axis of the wheel is substantially in the plane of the cross-bar, the frame comprising a central rod pivotally mounted to the forward portion of the frame, the lowermost position of said rod being located below the said peripheral frame, wherein, when the frame is lowered in contact with the ground, the said rod raises the wheel out of the frame.

3,924,764
RETRACTABLE OVERHEAD CARRIAGE FOR CARRYING CARGO ATOP A VEHICLE

Hugh A. Youngblood, Jr., 3225 N. Virginia, Oklahoma City, Okla. 73118

Filed Nov. 5, 1973, Ser. No. 413,041
Int. Cl.[2] B60R *9/00*
U.S. Cl. 214—450 **12 Claims**



1. A retractable overhead carriage adapted to be mounted atop a vehicle comprising:
   a plurality of elongated fixed supporting rails;
   means for mounting the supporting rails in spaced, horizontally extending positions atop a vehicle;
   a plurality of elongated movable rails each movably mounted on one of said supporting rails for horizontal movement thereon;
   a chain and sprocket assembly connected to each of said movable rails and each including:
      a chain having its opposite ends connected to the respective movable rails at points spaced horizontally therealong;
      a sprocket drivingly engaging the chain intermediate its length; and
      means rotatingly supporting the sprocket and pivotally connectable to said vehicle to facilitate pivotation of the respective chain and sprocket assembly and its respective movable rail about a horizontal axis; and
   means for arresting the movement of the movable rails about said horizontal axis, said arresting means comprising:
      an elongated arrestor arm having one end thereof pivotally connected to one of said movable rails; and
      a first roller carried on the other end of said arrestor arm rollingly engaging the underside of one of said supporting rails below said one movable rail at a location horizontally displaced from the point of pivotal connection of said arrestor arm to said one movable rail; and
      means for engaging said roller and arresting further rolling movement thereof along said one supporting rail at a time after said movable rail has undergone pivotal movement about said horizontal axis.

3,924,765
HYDRAULIC SIDE LIFT LOADER

Dewey L. Hostetler, R.R. No. 2, Box 4, Harper, Kans. 67058

Filed Mar. 1, 1974, Ser. No. 447,076
Int. Cl.[2] B60P *1/38*
U.S. Cl. 214—518 **8 Claims**

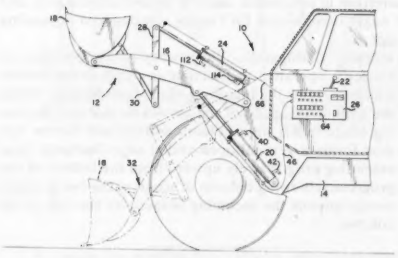
1. A loader and carrier for large, heavy, generally cylindrical bales of hay, or the like comprising:
   a. a vehicle having an elongated bed having a retaining cradle for a plurality of said bales end-to-end substantially throughout its length,
   b. a conveyor operably mounted on said bed constructed and adapted to move one of said bales along said retaining cradle, said conveyor mounted on said retaining cradle and bed and communicating therebetween,
   c. means connected to said conveyor means to operate same,
   d. a lifting cradle for said bale having a fork portion to receive and retain said bale between the tines thereof and pivotally mounted on the side of said vehicle and extending outwardly therefrom, said lifting cradle being pivotal from a generally horizontal and bale receiving position at a side of said vehicle to a generally upright and bale discharge position adjacent said retaining cradle,
   e. means connected to said vehicle and lifting cradle constructed and adapted to pivot same,
   f. said lifting cradle having spaced portions to receive and retain thereon in lifting relation one of said bales,

said loader and carrier being constructed and adapted to receive one of said bales on said lifting cradle, lift same onto said retaining cradle on said bed when said lifting cradle is pivoted to said generally upright position, and said conveyor being constructed and adapted to move said bale along said retaining cradle and to one end portion of said bed.

3,924,766
ADJUSTABLE PROGRAM CONTROL CIRCUIT FOR TWO HYDRAULIC CYLINDERS WITH SINGLE LEVER CONTROL

Michael H. Canning, Libertyville, Ill., assignor to International Harvester Company, Chicago, Ill.

Continuation of Ser. No. 871,790, Oct. 31, 1969, abandoned, which is a continuation of Ser. No. 668,474, Sept. 18, 1967, abandoned. This application July 6, 1970, Ser. No. 52,723
Int. Cl.[2] E02F *3/86*
U.S. Cl. 214—764 **13 Claims**



1. In a vehicle having a hydraulically actuated boom and a work implement supported by said boom and further having an operator control station on said vehicle, a control system comprising:
   first control means for correlating movement of said implement to said boom according to a first predetermined program;
   second control means for correlating movement of said implement to said boom according to a second predetermined program;
   and program selection means including a manually actuable member located at said operator control station for selectively actuating one of said first and second control means.

3,924,767
PLASTIC COATED CONTAINERS HAVING EMBEDDED FRICTION REDUCING PARTICLES

Roy S. Arrandale, Elmira, and Edward R. Campagna, Horseheads, both of N.Y., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Sept. 30, 1971, Ser. No. 185,051
Int. Cl.[2] B05D *5/00, 1/36;* **B65D** *11/16*
U.S. Cl. 215—12 R **2 Claims**

1. A container having improved frictional and handling characteristics in container handling apparatus, said container comprising an interior glass receptacle formed as a glass bottle and an exterior resinous plastic surface and a plurality of particles secured to said exterior plastic surface; said particles having exposed outwardly extending particle surfaces adapted to contact articles which touch said container, said particle surfaces further being hard and smooth relative to said container plastic surface so that friction will be reduced between said container and said articles due to contact of said hard smooth particle surface with said articles.

2. A container having improved frictional and handling characteristics in container handling apparatus, said container comprising an interior glass receptacle formed as a glass bottle and covered by a relatively soft resinous plastic coating, said glass receptacle being provided with protrusions which extend through said exterior plastic coating, said protrusions being adapted to contact articles which touch said container so that friction will be reduced between said container having said plastic coating and said articles.

3,924,768
CONTAINER CAP HAVING SAFETY LOCK MEANS

John B. Lemons, Clements, Calif., assignor to Bob Mar, Stockton, Calif.

Continuation of Ser. No. 358,008, June 7, 1973, abandoned. This application Aug. 20, 1974, Ser. No. 498,942
Int. Cl.[2] B65D *51/12*
U.S. Cl. 215—213 **38 Claims**

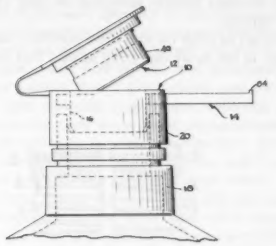
1. A cap for a container comprising:

a stopper seat, sized to fit into the mouth of and to rest on the mouth of a container;

a stopper, sized to fit into and conform to said stopper seat, including at least one slide channel formed in and directed across said stopper;

at least one recess in said stopper seat, aligned with said slide channels; and

at least one pin, equal in number to said slide channels, each

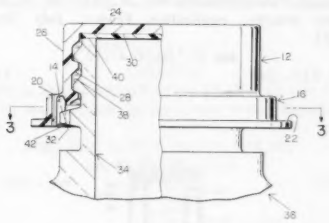


slidable in said recesses and one of said slide channels to lock said stopper into said seat.

3,924,769
SINGLE USE SAFETY CLOSURE

William E. Fillmore, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 20, 1974, Ser. No. 534,859
Int. Cl.[2] B65D *45/32, 55/02*
U.S. Cl. 215—216 **3 Claims**



1. A safety closure for a container, said container including a finish portion having threads formed on the exterior thereof and a plurality of external projections located below and adjacent to said threads, said safety closure comprising, in combination:

a main body member having threads formed in the interior thereof for engagement with the threads of said container finish;

a flexible skirt, attached to the lower portion of said main body member by a flexible circumferential ring, which is formed with a plurality of interior, inwardly directed projections; and

locking means, integrally formed with said main body member and said flexible skirt, for stiffening said flexible skirt when engaged therewith to prevent removal of said closure from said container when said internal and external projections are engaged, said locking means being movable out of engagement with said flexible skirt to thereby allow removal of said closure from said container.

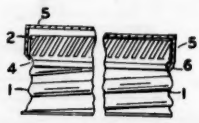
3,924,770
CHILD PROOF CLOSURE

Vincent Scuderi, East Williston, N.Y., assignor to Van Blarcom Closures Inc., Brooklyn, N.Y.

Filed Feb. 11, 1975, Ser. No. 548,907
Int. Cl.[2] B65D *55/02*
U.S. Cl. 215—220 **3 Claims**

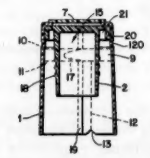
1. A child proof closure for containers having a threaded neck comprising,

a screw type cap,
a first set of teeth on the side of said cap, said teeth being set at an angle to the axis of said cap,
a drive member loosely mounted on said cap for limited axial motion,
a second set of teeth on said drive member, said teeth being angled in the same direction as said first set of teeth,



whereby when said drive member is turned in the direction to remove the cap, the interaction of said teeth lifts the drive member relative to the cap and the first and second sets of teeth disengage so that the cap cannot be removed solely by turning.

3,924,771
BOTTLE CAP HAVING A PRESHRUNK FOIL PORTION
Günther Cleff, Idsteinerstrasse 33, 62 Wiesbaden, Germany
Continuation-in-part of Ser. No. 275,252, July 26, 1972, abandoned. This application Nov. 20, 1973, Ser. No. 417,554
Claims priority, application France, July 30, 1971, 71.28012
Int. Cl.[2] B65D *45/32*
U.S. Cl. 215—246 **19 Claims**



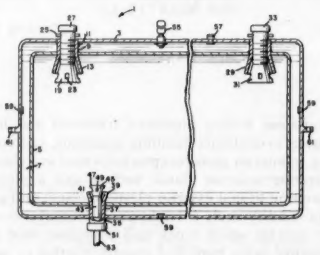
1. A bottle cap for a bottle having a neck containing an orifice to be closed by said cap comprising an encapsulating element of heat shrinkable foil material that has been preshrunk in the form of a thin tubular wall containing substantial residual shrinking capacity and adapted for fitting with clearance over the outer side of said bottle neck during initial assembly, said preshrunk tubular wall having longitudinal portions of different residual shrinking capacity according to a predetermined pattern.

3,924,772
AIRTIGHT CONTAINER CAP
Eugenio Magnani, Fidenza (Parma), Italy, assignor to Fidenza Vetraria S.p.A., Milan, Italy
Filed Jan. 30, 1975, Ser. No. 545,362
Claims priority, application Italy, Feb. 8, 1974, 20319/74
Int. Cl.[2] B65D *45/32, 45/34, 45/30*
U.S. Cl. 215—276 **6 Claims**

1. An airtight container cap comprising a ring-nut provided, on the top surface thereof, with a circular hole and on the side surface thereof, with at least one window, a stopper adapted for removable engagement with the circular hole in said ring-nut and an elastic gasket provided with a central opening

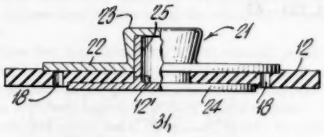
adapted to be removably inserted within said ring-nut in alignment with the window.

3,924,773
FUEL TANK
Nelson C. Wilkinson, 1818 - 4th St., Rensselaer, N.Y. 12144
Filed May 1, 1974, Ser. No. 465,807
Int. Cl.[2] F16K *17/20;* **B65D** *25/18*
U.S. Cl. 220—88 B **8 Claims**



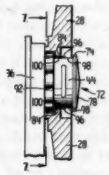
1. A fuel tank for liquid fuel having a fuel line and having fuel-line, valve means responsive to pressure build up on the fuel in said fuel tank to permanently close said fuel line, said valve means comprising a fuel-line housing and a fuel-line valve, said fuel tank carrying said fuel-line housing, said fuel-line housing being in communication with said fuel line and said fuel tank, said fuel-line housing having an open cylindrical portion and an open conical portion outwardly flared therefrom, said fuel-line valve having an open cylindrical portion and conical portion outwardly flared therefrom, said conical portion of said fuel-line valve having a closed bottom, said conical portion of said fuel-line valve having wall opening formed therethrough, said fuel-line valve being complemental with said fuel-line housing, said cylindrical portion of said fuel-line housing receiving and carrying, by means of slight interference fit, said cylindrical portion of said fuel-line valve, said liquid fuel in said fuel tank communicating with said fuel line through said wall openings in said conical portion of said fuel-line valve, through said open cylindrical portion of said fuel-line valve and through said open cylindrical portion of said fuel-line housing when said fuel-line valve is in its open position, said pressure build up on said liquid fuel in said fuel tank acting upon said closed bottom of said conical portion of said fuel-line valve to cause said conical portion of said fuel-line valve to permanently seat itself against said open conical portion of said fuel-line housing by interference fit to permanently close communication of said fuel tank with said fuel line.

3,924,774
CLOSURE FOR CONTAINERS
John H. Donnelly, 343 E. 30th St., New York, N.Y. 10016
Filed Oct. 11, 1972, Ser. No. 296,635
Int. Cl.² B65D *25/10*
U.S. Cl. 220—93 **3 Claims**



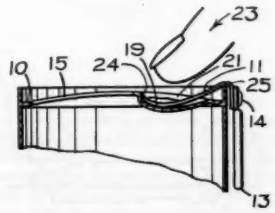
1. A removable closure for containers comprising a disc of relatively air-impervious resilient deflectable material having a selected peripheral configuration, a central relatively rigid support overlying said disc and secured to the disc centrally thereof, the area of said support being smaller than the area of said disc so that the edges of said disc can deflect relative to the edges of said support and a handle secured to and extending from said closure whereby said closure upon being inserted within a container will cause the edge of said disc to deflect upwardly and conform to the configuration of the container, said disc including at least one opening extending therethrough, said opening underlying the edge of said support and being normally closed thereby, said disc upon being deflected downwardly by removal of the closure from the container opens said opening to permit the flow of air therethrough.

3,924,775
POSITIVELY LOCKABLE ANGULARLY ADJUSTABLE HANDLE
Joseph R. Andreaggi, Short Hills, and George Zenuch, Edison, both of N.J., assignors to Weston Instruments, Inc., Newark, N.J.
Filed June 4, 1973, Ser. No. 367,040
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² B65D *25/28*
U.S. Cl. 220—96 **10 Claims**



1. A portable instrument comprising:
a housing member;
a generally U-shaped resilient handle member having first and second coextensive arms substantially parallel to a plane and having respective first and second ends, said arms being resiliently movable relative to one another parallel to said plane; and
first and second means respectively adjacent said first and second ends for coupling said handle member to said housing member, each said coupling means including:
journal means having an axis and including a tubular resilient wall projecting from one of said members in a generally axial direction,
the other of said members having an internal wall centered on said axis and defining at least one aperture in which said tubular wall is received in a first axial position thereof for rotation about said axis,
inwardly yieldable stop means on the outer surface of said resilient tubular wall,
retainer means within said aperture for engaging said stop means to retain said resilient tubular wall against axial movement within said aperture in one direction between said first axial position and a second axial position thereof axially displaced with respect to said first position in said one direction when said tubular wall is subjected to an axial force smaller than a given value, and for inwardly camming said yieldable stop means resiliently into said resilient tubular wall upon axial displacement thereof within said aperture in said one direction toward said second axial position when said tubular wall is subjected to an axial force greater than said given value,
first interlocking means disposed upon said one member,
second interlocking means upon said other member for engaging said first interlocking means when said tubular wall is in its said second axial position to lock said handle member in a selected angular locking position with respect to said housing member,
said second interlocking means being disengaged from said first interlocking means when said tubular wall is in its said first axial position for permitting rotation of said handle member with respect to said housing member to select a desired angular locking position for said handle and housing members,
whereby said handle member can be locked in the selected angular position by moving said first and second resilient arms substantially parallel to said plane for causing said resilient tubular wall to shift from its said first to its said second axial position to lockingly engage said first and second interlocking means in the selected angular position.

3,924,776
RETAINER FOR A SEPARATED TEAR TAB ON A CAN
Patricia J. Horst, 2610 Spring Creek Road, Rockford, Ill. 61107
Filed Mar. 6, 1975, Ser. No. 555,829
Int. Cl.² B65D *17/20*
U.S. Cl. 220—269 **8 Claims**



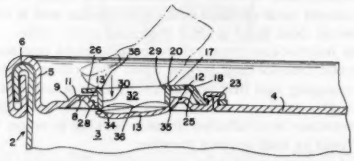
1. A can having an integral closure surrounded by a weakened section defining a tear line and a handle affixed to said closure adjacent the tear line, whereby the closure may be separated from the can along said tear line by pulling on the handle, the invention comprising a pair of spaced opposed walls on the exterior of said can, said walls shaped to receive and retain therebetween the closure separated from said can.

3,924,777
NON-DETACHABLE EASY OPEN FLAP AND TAB ASSEMBLY
Harry A. Peyser, Olympia Fields, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
Filed Feb. 1, 1974, Ser. No. 438,910
Int. Cl.² B65D *41/02*
U.S. Cl. 220—277 **8 Claims**

1. In an easy opening container having an end panel with a score defining a flap adapted to be torn away from the panel

to provide an opening, said flap being offset from the panel in a recess formed therein,

an opener comprising a tubular element adapted to fit into the recess and superposed with respect to said flap and in axial alignment therewith and having a plurality of spaced diametrically opposed lance points in alignment with said score for rupturing the score in areas thereadjacent, an anchor strap on the element in radial alignment with one of said lance points and including means for hingedly



connecting said element to said panel, said one lance point serving as a fulcrum for said element upon application of digital force against said element over another point diametrically opposed to said one point, said another point being aligned with said one point and said anchor strap so that upon application of said force said strap will be loaded in tension and said one point in compression thereby effecting a canting action of the element, both of said points being of equal depth.

3,924,778

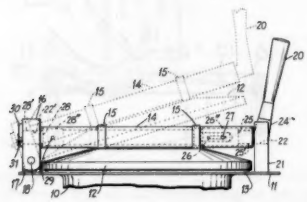
PRESSURE VESSEL SEAL AND LOCK

Egon Sorensen, Clinton, Conn., assignor to AMF Incorporated, White Plains, N.Y.

Filed Dec. 20, 1974, Ser. No. 534,718

Int. Cl.[2] B65D *45/28*

U.S. Cl. 220—314 **3 Claims**



1. A mechanism for sealing and locking a cover to an opening, said mechanism comprising a block on opposite sides of said opening, a cylindrical hole in each of said blocks, said holes being aligned on a common axis, a cylindrical tube extending between said blocks, a cylindrical bearing in each of said holes, cylindrical eccentrics on each of said bearings extending into opposite ends of said tube, means connecting said eccentrics to said tube whereby said bearings, eccentrics and tube rotate in unison, means rotatable with respect to said tube for suspending said cover off said tube, one of said blocks having pivotal mounting for hinged movement away from said opening, the bearing in the other of said blocks being adapted for sliding movement into and out of the same, and handle means connected to said last mentioned bearing to either rotate the same in its block or to move it in and out of its block.

3,924,779

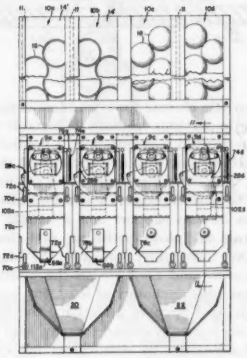
ADAPTABLE ARTICLE DISPENSING APPARATUS WITH CAM ACTUATING MEMBER

James C. Lindsey, Chattanooga, Tenn., assignor to Cavalier Corporation, Chattanooga, Tenn.

Filed Aug. 7, 1974, Ser. No. 495,492

Int. Cl.[2] G07F *11/08*

U.S. Cl. 221—67 **10 Claims**



1. Apparatus for dispensing a single article at a time from at least two staggered stacks of the articles in a bin, corresponding articles in the two staggered stacks being axially aligned of each other, said apparatus comprising:

a. selectively energizable motor means;

b. cam means coupled to said motor means to be rotatively driven, said cam means comprising a cam surface, and first and second switch actuating surfaces;

c. first and second article support members disposed transversely across the lower end of said bin and mounted for movement from a first supporting position wherein one of said first and second article support members engages and supports the lowermost articles of the staggered stacks, to a second releasing position to permit the discharge of the articles from said bin;

d. latch means pivotably mounted to be moved from a first rest position wherein said latch means engages and holds said first and second article support members in their first supporting positions when said apparatus is in a stand-by condition, to either of a second position wherein said latch means engages and holds said first article support member to prevent its downward movement to its second article releasing position, or of a third position wherein said latch means engages and holds said second article support member against movement to its second article releasing position;

e. a reciprocally mounted operating plate having a surface for engaging and controlling the movement of said first and second article support members and reciprocally movable between a first position, wherein said first and second article support members are in their first position and a second position wherein a selected one of said first and second article support members is lowered with said operating plate to its second article releasing position;

f. first releasable lock means for retaining said pivotably mounted latch means in its first rest position;

g. control means for selectively operating said motor means and including initiating means for initiating the energization of said motor means whereby said cam means is rotatively driven and said cam surface engages said first lock means disengaging it from said pivotably mounted latch means so that said latch means rotates to either of

its second or third positions and said cam surface engages said operating plate directing it toward its second position whereby said one support member follows said operating plate to its second article releasing position;

h. switch means disposed to be engaged by said first and second switch actuating surfaces of said cam means and responsive thereto to interrupt the energization of said motor means thus terminating the rotation of said cam means;

i. an escrow bar movable from a first normal position for retaining one of the two articles released from the stacks of articles by one of said first and second support members, to a second article releasing position; and

j. a second releasable lock means engagable by said cam surface of said cam means to be disposed from a first locking position wherein said second lock means retains said escrow bar in its first normal position to a second unlocked position, wherein said second lock means releases said escrow bar and said escrow bar is disposed to its second article release position;

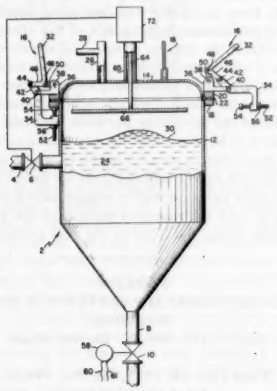
k. said initiating means being initiated a second time for energizing said motor means and continuing the rotation of said cam means to dispose said second lock means to its second position, thus permitting the movement of said escrow bar to its second position and the release of the retained article, until said second switch surface engages said switch means to de-energize said motor means and to terminate the movement of said cam means at its starting position.

3,924,780

PRESSURE HOPPER

Robert M. Elsworth, Loudonville, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Nov. 28, 1973, Ser. No. 419,531
Int. Cl.[2] B67D *5/08*
U.S. Cl. 222—64 **5 Claims**



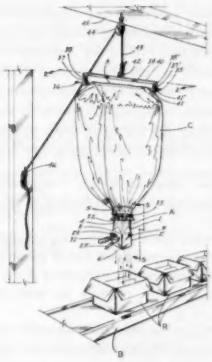
1. A pressure hopper for handling a highly viscous fluid which comprises a hollow body for holding said fluid, a removable top cover with a configuration adapted for a close fit with the rim of an aperture in the upper portion of said body wherein the peripheral edges of said cover and said rim are provided with strong flanges, a sealing gasket located between said cover and said rim, a plurality of rapidly releasable toggle joint clamps disposed around the peripheries of said cover and said rim for quickly and strongly locking said cover to said rim by throwing the toggle joint of each said clamp beyond the neutral point and into the locking position thereof by movement of an operating handle of each said clamp into a substantially erect position extending substantially above said rim and said cover, said clamps being affixed to one of said flanges with a movable operating handle of each said clamp in the locking position extending above said flanges, and a capacitive sensing means for controlling the flow of said fluid into said hopper to maintain the level of said fluid inside said hopper within a predetemined range, said sensing means comprising the pool of said fluid in said body and a substantially flat plate of electrically conductive material suspended substantially horizontally inside said hopper from said cover and located adjacent to and above the surface of said fluid and electric means for sensing a capacitive charge between said plate and said pool.

3,924,781

DISPENSER APPARATUS SUSPENDED FOR BOTTOM DISCHARGE

Henry C. Witte, Memphis, Tenn., assignor to International Comador of Memphis, Inc., Memphis, Tenn.

Filed Aug. 8, 1974, Ser. No. 495,548
Int. Cl.[2] B67D *5/06*
U.S. Cl. 222—80 **1 Claim**



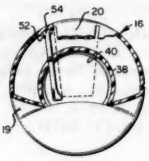
1. The combination with a bulk dispenser having a normally closed bottom portion and an openable content outlet at its normally upper end, means for suspending said container in inverted position whereby its outlet will be disposed at its lower end as suspended, said means comprising a rod extending transversely through said container in its normally closed bottom portion with the ends of said rod extending beyond said container, and hanger means detachably engaging said rod in its projecting end portions, a pulley engaged to said hanger means, means presenting said pulley in elevated relation to said suspended container, a cable connected to said hanger means and extending about said pulley, means provided on said rod for facilitating piercing of rod receptive openings in the said normally closed bottom portion of said container through which openings said rod extends, means for restricting axially slideable displacement of said rod with respect to said container, of a dispensing apparatus having means defining a tubular casing with a normally upper inlet end and a normally lower discharge end, means for connecting said casing upper end to said container content outlet while in suspended condition, the normally upper inlet end of said casing being flared and being received within the outlet end of said suspended container, resilient means engaging the outlet end portion of said container about said flared upper end of said dispensing apparatus, a closure member movably provided within said casing, means pivotally engaging said closure member for movement between upper or casing closed condi-

tion and lower casing open condition, and means controlling operation of said closure member.

3,924,782
SAFETY CLOSURE ASSEMBLY FOR CAPPING A DISPENSING CONTAINER

Rupert M. Starrett, Stratford, Conn., assignor to The Risdon Manufacturing Company, Naugatuck, Conn.

Filed Dec. 23, 1974, Ser. No. 535,963
Int. Cl.² B67D 5/32
U.S. Cl. 222—402.11 **9 Claims**



1. A safety closure assembly for capping an end of a container equipped with dispensing means having an actuating stem projecting from that end of the container, and for operating the actuating stem to dispense product from the container, performance of two functions being a requisite to operation of the dispensing means, said closure assembly comprising:

a collar adapted to be non-rotatively mounted about the actuating stem of the container, said collar having a keying element;

cam means, also adapted to be non-rotatively mounted about the actuating stem and having at least one projecting cam lobe;

an overcap member for enclosing the actuating stem of the container and equipped with catch means in its interior, said cap having means for mounting it on the end of the container for rotation relative to said collar and cam means;

stem actuator means associated with said overcap member having a discharge orifice and a socket opening, adapted to receive the end of said actuator stem, interconnected to said discharge orifice, said actuator means also having a pressure pad and a keying element complementary to said collar element;

a locking member mounted in the interior of said overcap and biased to a normal locking position, said locking member having a cam follower operatively engaged by said cam means upon rotation of said overcap when installed on the container, and latch means to engage said catch means and retain the locking member against return to its normal biased position, said locking member normally assuming a position between said pressure pad and said collar when said latch means is disengaged from said catch means to limit depression of said stem actuator means;

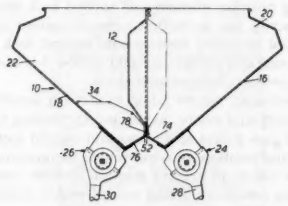
whereby rotation of said overcap member relative to said collar and cam means moves said locking member radially outwardly to retract said locking member from between said collar and said stop means and into engagement with said catch means, and whereby further rotation permits alignment of said keying elements to allow depression of said stem actuator means, said keying elements, except when thus aligned, cooperating to block depression of said stem actuator means relative to said overcap; and

reset means associated with said stem actuator means for disengaging said latch means from said catch means upon depression of said stem actuator means, allowing said locking member to return to blocking position between said actuator pressure pad and said collar.

3,924,783
REVERSIBLE HOPPER PARTITION FOR COMBINE DRILL

Frederick H. Ward, deceased, late of Coventry, England (by Dilys Annie Jane Ward, administratrix), assignor to Massey-Ferguson-Perkins Limited, London, England

Filed Nov. 8, 1972, Ser. No. 304,687
Claims priority, application United Kingdom, Nov. 18, 1971, 53712/71
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² B65D 1/24
U.S. Cl. 222—134 **4 Claims**



1. A combined seed and fertilizer drill hopper with at least one reversible partition wall for dividing the hopper into front and rear compartments characterized by the hopper including wall means forming an elongated trough, end walls and an open top, at least two rows of openings in the lower portion of said elongated trough, seed and fertilizer metering mechanisms each positioned to receive either seed or fertilizer from at least one of the openings in the lower portion of said elongated trough, a generally vertical elongated bottom flange attached to the wall means forming an elongated trough between rows of openings in the lower portion of said elongated trough, and at least two generally vertical end flanges extending inwardly from each end wall and lying substantially in a plane that is parallel to the long axis of the elongated trough and that contains the bottom flange; and the reversible partition wall for dividing the hopper into compartments including partition bottom flange means and two partition end flanges in substantially the same generally vertical plane parallel to the long axis of the reversible partition wall and a section of the partition wall between said flanges that is recessed to one side of the plane that is parallel to the long axis of the reversible partition wall and fastening means for holding the flanges on the reversible partition wall in engagement with the flanges in the hopper with the recessed portion of the partition wall extending into either the front or the rear compartment.

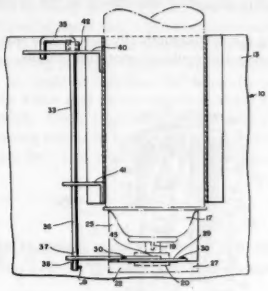
3,924,784
STRIPE-ADJUSTING APPARATUS FOR SPRAYING MACHINE

Thomas J. Smrt, 31W 300 W. Bartlett Road, Bartlett, Ill. 60103

Filed Feb. 14, 1975, Ser. No. 549,812
Int. Cl.² A01C 15/00
U.S. Cl. 222—176 **8 Claims**

1. In an aerosol spraying machine equipped with an aerosol can containing material to be sprayed, the aerosol can including an actuating stem and a nozzle rotatably mounted on the actuating stem and having an elongated spraying orifice, the spraying machine including an actuating member slidably mounted on the spraying machine for movement in a direction generally perpendicular to the actuating stem, a stripe-adjusting apparatus for varying the width of a stripe of material sprayed by the aerosol can comprising a nozzle-engaging member mounted on the spraying machine for rotation about an axis extending generally parallel to the actuating stem, the nozzle-engaging member having means for engaging the noz-

zle for rotating the nozzle with the nozzle-engaging member as the nozzle-engaging member is rotated whereby the rectangu-



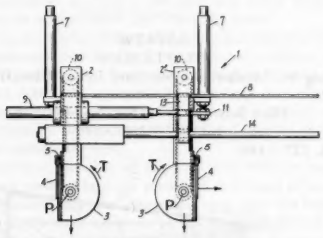
lar spraying orifice of the nozzle can be rotated about said axis.

3,924,785

HEM FORMING APPARATUS

George P. Diacont, Jr., and Vincent J. Serio, Jr., both of Richmond, Va., assignors to AMF Incorporated, White Plains, N.Y.

Filed Nov. 15, 1974, Ser. No. 524,175
Int. Cl.² A41H *43/00*
U.S. Cl. 223—2 **9 Claims**



1. An apparatus for forming an overlay of material in the nature of a hem, upon a tubular section of material positioned in said apparatus, including: an apparatus super-structure; ways attached to said super-structure; a pair of parallel disposed arms mounted on said ways, each of said respective arms being provided with pivotally mounted sleeve members integrally formed therewith; material engagement means connected to each of said sleeves and spaced apart therefrom to form a clearance space therebetween for inserting said tubular material into such space; stop means provided on each of said arms for adjusting the length of said clearance space; and prime mover means connected to said arms for laterally moving said arms on said ways.

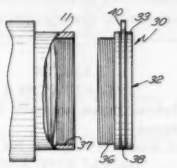
3,924,786

PHOTOGRAPHIC LENS SAFETY RING

Richard W. Duquette, 21 Rosewood Ave., Cranston, R.I. 02905

Filed Feb. 14, 1974, Ser. No. 442,440
Int. Cl.² A45F *5/02*
U.S. Cl. 224—5 V **2 Claims**

1. A photographic lens safety ring for interchangeable lenses having a female threaded section adjacent the objective thereof comprising a cylindrical member having an outer wall of stepped formation defining two diameter portions and an inner wall having two diameters, a band having an anchor means thereon, said band being received about the larger diameter portion of said outer wall, groove means defined on said portion for retaining the band on said outer wall portion for rotation thereabout in slidable relation therewith, a tether line attached to said anchor means and having its other end provided with means to attach to the body of the camera user, said outer wall having a threaded surface extending inwardly



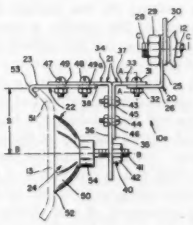
from the one edge of said member on the smaller diameter portion, the inner wall of said cylindrical member having a threaded surface extending inwardly from the other edge of the member in the larger diameter, said threaded surfaces being of the same mating size of pitch and diameter, whereby an accessory normally received in the threaded section of the lens of a camera is selectively received in the inner threaded portion of the safety ring while the outer threaded portion may inturn be received in the threaded section of the camera lens.

3,924,787

CARRIER BRACKET FOR ATTACHING A BICYCLE RELATIVE TO A MOTOR VEHICLE'S BUMPER

James Pershing Gothrup, 3809 14th Ave., Oakland, Calif. 94602

Filed Jan. 7, 1974, Ser. No. 431,206
Int. Cl.² B60R *9/10*
U.S. Cl. 224—42.03 B **9 Claims**



1. Carrier bracket means for connecting a wheeled bicycle relative to a motor vehicle's bumper but carryable—in to-to—in permanent relationship relative to said bicycle in a manner which does not unduly hinder normal cycling operations, comprising:

i. surmounting means fixedly attached to and offset from a wheel axle of said bicycle extending away from a central plane of reference through said wheel,

ii. offset linking means disconnectably attached to said surmounting means at a predetermined offset position remote with respect to said central plane of reference, said offset linking means having adjustable cooperative bumper engaging means thereon, said linking means and said bumper engaging means being capable of pivotal movement with respect to said surmounting means to a stowed position so as to not interfere and hinder normal cycling operations,

iii. said cooperative bumper engaging means including a suction cup attaching means and an upper bumper edge engaging bar means attached to said offset linking means

at other selected offset locations more remote with respect to said central plane of reference,

iv. said cooperative bumper engaging means being operative in response to components of force occurring during attachment of said cooperative bumper engaging means relative to said vehicle's bumper, to quickly affix said bicycle relative to said bumper,

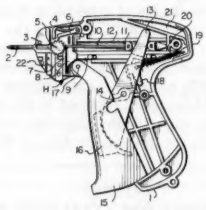
v. offset lengths for and elevational spacing above a datum of said offset linking means and said cooperative bumper engaging means being sufficiently small so as not to interfere with said normal cycling operations of said bicycle.

3,924,788

TAG ATTACHER

Akira Furutu, Tokyo, Japan, assignor to Japan Bono'k Co., Ltd., Tokyo, Japan

Filed June 7, 1974, Ser. No. 477,421
Int. Cl.² B25C *1/00*
U.S. Cl. 227—67 **4 Claims**



1. Apparatus for attaching tags using one piece plastic fasteners, each fastener including a bar section and a head section joined by a filament section, said apparatus comprising a body, a needle which is mounted on the end of said body, a driving rod for pushing the bar section of said fastener in a bore in the center of the needle, a second lever operably connected to said driving rod for pushing said driving rod into said bore, a first lever operably connected to said second lever for driving said second lever, a gear for feeding the fasteners one by one to said needle, a sliding rod positioned in parallel with said driving rod said sliding rod being engaged by said second lever and moved thereby at the end of movement of said second lever, moving means for moving in a direction crossing said sliding rod, a pawl on said moving means, said pawl meshing with said gear to rotate said gear, a cam means for transferring movement of said sliding rod to said moving means and a stopper means for allowing said gear to rotate in only one direction, said stopper means including a tooth for meshing with said gear.

3,924,789

ELECTRIC FASTENER DRIVING TOOL

Hazelton H. Avery, Aurora, and Salvatore Morabito, Northlake, both of Ill., assignors to Duo-Fast Corporation, Franklin Park, Ill.

Filed June 7, 1973, Ser. No. 367,812
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² B25C *1/06*
U.S. Cl. 227—131 **11 Claims**

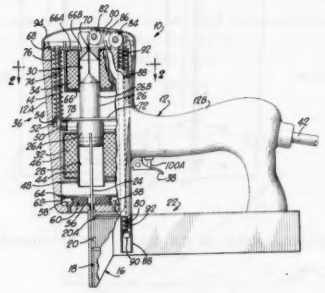
1. An electric tool for driving fasteners into a workpiece using an electric potential comprising

a housing with a nosepiece structure defining a drive track, a magazine assembly for feeding successive fasteners into the drive track at a given position therein,

fastener driving means including a driver movable in the drive track and an armature for actuating the driver, said driver normally occupying at least a portion of said given position in the drive track to prevent a fastener from entering the drive track,

resilient operating means coupled to the fastener driving means for imparting movement to the driver by resilient force,

winding means magnetically coupled to said armature for stressing the resilient operating means,



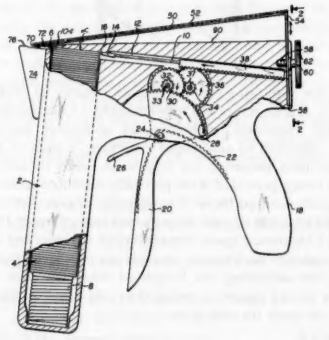
and a control circuit coupled to the winding means and energized by the potential for energizing the winding means for a period of time to stress the resilient operating means and then deenergizing the winding means to release the resilient operating means and to momentarily withdraw the driver from said given position in the drive track so that the magagine assembly can feed a fastener into the drive track beneath the driver.

3,924,790

STAPLE GUN

Wolfgang W. Moeller, 4 Glen Cove Drive, Glen Head, N.Y. 11545

Filed July 12, 1974, Ser. No. 488,136
Int. Cl.² B25C *7/00*
U.S. Cl. 227—148 **4 Claims**



1. A hand held and actuated apparatus for propelling a fastening means into a generally flat workpiece which comprises a stationary palm member and a spring-biased finger grip, said finger grip connected to an arcuate rack, said arcuate rack connected through a geared transmission to a longitudinally running staple driver having a lip, said staple driver being received in a guide track in a staple driver housing, said apparatus having a magazine having an exit in alignment with said lip of said staple driver, means within said magazine for feeding fastening means into said guide track in alignment with said lip, said staple driver housing having pivotally con-

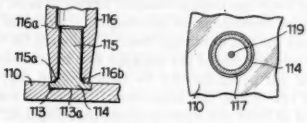
nected thereto proximite the end of said guide track a generally planar member which extends generally over said staple driver housing and is height regulatably fastened thereto, said planar member inclined at an angle of less than 90° to said staple driver housing, such that when the upper surface of said planar member is flush against a generally flat workpiece, said staple driver housing and said staple driver are inclined to said workpiece at an angle of less than 90° whereby actuation of said finger grip when said planar member abuts a workpiece causes said staple driver to move forward into engagement with said fastening means in said guide track and to urge said fastening means into said workpiece at an angle of less than 90°.

3,924,791

METHOD OF MAKING A DIAL FOR A WRIST WATCH

Noriaki Shimizu, 521 - 5, Imafuku, Ohaza, Kawagoe, Saitama, Japan

Division of Ser. No. 326,023, Jan. 23, 1973, Pat. No. 3,803,832. This application Dec. 27, 1973, Ser. No. 412,290
Claims priority, application Japan, Feb. 1, 1972, 47-11541
Int. Cl.² B23K *19/04*
U.S. Cl. 228—110 **1 Claim**



1. A method of making a dial structure for a wrist watch comprising in combination the following steps:

a. making a circular-shaped dial body formed of a flat plate of aluminum and having front and rear surfaces,

b. forming a plurality of circular recesses on the rear surface of said dial body adjacent the periphery thereof,

c. forming each of said recesses so that the bottom surface continuously tapers from an elevated medial section to the periphery thereof,

d. providing a plurality of circular rivet like pin members wherein each of said pin members is formed of an aluminum material and has elongated stem and flat head portions, each stem portion being integrally joined to its respective flat head portion and adapted to engage with a time keeping mechanism, each of said stem portions having an enlarged neck portion at the joint of said stem portion and said flat head portion,

e. positioning said flat head portion of each of said pin members in a perpendicular manner with said elevated medial section of each of said inner surfaces of said recesses, respectively, of said dial body, and

f. ultrasonically welding to integrally join said flat head portions with said elevated medial sections, respectively, to form a circumferential weld portion and a central weld portion.

3,924,792

METHOD OF MANUFACTURING A VACUUM-TIGHT ELECTRIC LEADTHROUGH IN AN ELECTRIC DISCHARGE TUBE

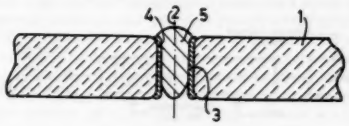
Gerardus Arnoldus Herman Maria Vrijssen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, N.Y., N.Y.

Division of Ser. No. 308,767, Nov. 22, 1972, Pat. No. 3,865,970. This application Oct. 17, 1974, Ser. No. 515,702
Claims priority, application Netherlands, Dec. 7, 1971, 7116765
Int. Cl.² B23K *31/02*
U.S. Cl. 228—118 **9 Claims**

1. A method of manufacturing a vacuum-tight electric leadthrough in an electric discharge tube comprising a hole in the tube envelope at the area of the leadthrough, comprising the steps of:

a. covering the wall of the hole with a thin layer of metal,

b. providing in said hole a plug consisting essentially of one of indium and an indium alloy,



c. degassing the assembly in a vacuum and at elevated temperature,

d. dissolving the metal layer in the material of said plug, and, then,

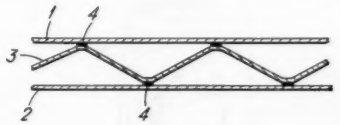
e. cooling said material, whereby said material rigidly adheres to the wall of the hole.

3,924,793

FORMING METALS

Leo Ewart Arthur Summers, and David Sidney Underhill, both of Bristol, England, assignors to British Aircraft Corporation Limited, London, England

Filed July 22, 1974, Ser. No. 490,887
Claims priority, application United Kingdom, July 24, 1973, 35293/73
Int. Cl.² B23K *31/00;* **B21D** *47/00*
U.S. Cl. 228—157 **7 Claims**



1. A method of forming a stiffened panel including the steps of positioning a metal face sheet on each side of an interior sheet of a metallic alloy having superplastic characteristics, attaching spaced regions of the said interior sheet alternately to the face sheet on one side and to the face sheet on the other side of the interior sheet, sealing the said face sheets one to the other to form an inflatable envelope assembly, bringing the assembly to within that temperature range at which the interior sheet exhibits superplastic characteristics, and applying a differential pressure between the interior and the exterior of the envelope assembly thus causing the face sheets to move apart and draw the attached regions of the interior sheet with them so that the said interior sheet finally extends from one face to the other in alternate sequence.

3,924,794

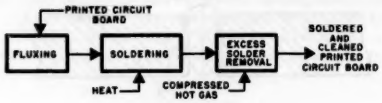
SOLDER LEVELING PROCESS

Travis A. Allen, and Robert T. Sylvester, both of Albuquergue, N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Division of Ser. No. 388,305, Aug. 14, 1973, Pat. No. 3,865,298. This application Dec. 2, 1974, Ser. No. 528,975
Int. Cl.² H05K *3/22, 3/34*
U.S. Cl. 228—256 **3 Claims**

1. A process for removing excess solder from areas and through-holes of a printed circuit board containing conductive areas and through-holes of diameter as small as 0.020 inch between opposite sides of the board comprising, fluxing both sides of said board, contacting both sides of said fluxed board with molten solder, heating a gas to a temperature of from about 375°F to about 600°F, forming said gas into a pair of elongated jets of width from about 0.016 to about 0.020 inch,

while so heated and of such width directing said jets from a distance of about 0.065 to 0.070 inch toward an intermediate board movement path for impingement against opposite sides of said board at pressure of from about 20 to about 80 pounds

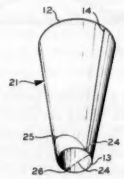


per square inch with said jets impinging on opposite board areas out of registry with each other, subsequent to said impinging deflecting the impinging gas away from said contacting molten solder, and elevating said board through said movement path and impinging jets.

3,924,795
FRUSTOCONICAL CONTAINER AND BLANK THEREFOR

Ernest L. Smith, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 12, 1974, Ser. No. 478,537
Int. Cl.[2] B65D *3/06*
U.S. Cl. 229—4.5 **12 Claims**

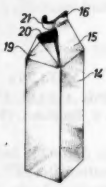


1. A blank for forming a generally frustoconical container, said blank having a top edge, a bottom edge opposite said top edge, and first and second opposite side edges; said first side edge extending at least substantially along a first radial ray of a first circle having a radius greater than the length of either of said first and second side edges; said second side edge extending at least substantially along a second radial ray of said first circle; said top edge at least generally corresponding to an arc of said first circle; said bottom edge at least generally corresponding to an arc of a second circle; at least one of said first and second side edges having a marginal portion extending along the length thereof lying outside the respective one of the first and second radial rays to provide a seam margin along the one of said side edges for overlapping and bonding to the margin along the other of said side edges in the formation of said blank into a preform having a generally frustoconical configuration with generally circular openings at the top and bottom ends thereof; at least one arcuate score line being formed in said blank along one of the top margin and the bottom margin thereof, each said arcuate score line diverging outwardly to the adjacent edge to form an enfoldable panel which can be folded inwardly along the respective arcuate score line to thereby at least substantially close one of said generally circular openings of said preform.

3,924,796
PACKAGING CONTAINERS

Gad Anders Rausing, Lund; Sven Olof Soren Stark, Rydsgard, and Sven Gosta Uno Sevrell, Lund, all of Sweden, assignors to Tetra Pak Developpement SA, Lausanne, Switzerland

Filed June 27, 1972, Ser. No. 266,721
Claims priority, application Sweden, July 8, 1971, 8821/71
Int. Cl.[2] B65D *5/74*
U.S. Cl. 229—17 G **3 Claims**

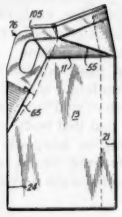


1. In a packaging container formed from a flat blank of a polystyrene foam packaging material having at least one layer of at least one homogeneous thermoplastic material thereon, the container having, at the top thereof, a sealing fin extending upwardly from the top of the package and transversely thereacross, said fin being formed by heat sealing together two sections of the blank, the improvement wherein the at least one layer of at least one homogeneous thermoplastic material on the sections forming the fin are molecularly oriented only in the longitudinal direction of the sealing fin across the top of the container, to facilitate tearing said fin to open the container.

3,924,797
PAPERBOARD CARTON

Warren R. Furbeck, Knoxville, Tenn., assignor to International Paper Company, New York, N.Y.

Filed Dec. 14, 1973, Ser. No. 424,713
Int. Cl.[2] B65D *5/72*
U.S. Cl. 229—17 G **28 Claims**



1. In combination with a paperboard gable top container having a gable ridge, said container including foldably connected vertical front, back and side walls and front and back pairs of gusset panels, the improvement which comprises:

a. a first pair of non-vertical panels foldably connected to said back wall;

b. a second pair of non-vertical panels, each foldably connected to a respective one of

i. said side walls,

ii. said first pair of non-vertical panels, and

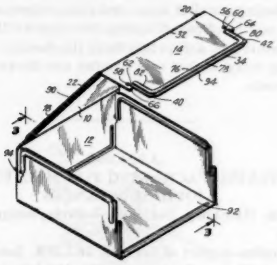
iii. said back pair of gusset panels; and

c. a handle, foldably connected to said second pair of non-vertical panels.

3,924,798
RELATIVELY FLAT BLANK FOR A CONTAINER AND THE CONTAINER MADE THEREFROM

Saul Saveth, 132-29 33rd Ave., Flushing, N.Y. 11354

Filed Nov. 22, 1974, Ser. No. 526,371
Int. Cl.[2] B65D *11/10, 11/22*
U.S. Cl. 229—23 AB 15 Claims

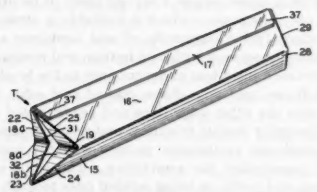


1. A collapsible container comprising first and second separate sections each including hingeably connected, generally quadrilateral central and wing sectors with the wing sectors being connected on opposite sides of the central sector so that each central sector has two opposite free edge sides and two further sides connected to the associated wing sectors, the sectors of the first section corresponding at least substantially in size and shape to the sectors of the second section, the sections each being foldable into a U-shape and being interengageable with each other to form a parallelepiped structure enclosing a chamber, each wing sector having a side connected to the associated central sector and an opposite parallel free side, each wing sector further having two lateral sides extending between the first two said sides thereof, and hook-shaped members on the lateral sides of said wing sectors of each section for locking the wing sectors together, each central sector being provided with grooves extending along and adjacent the free sides thereof for receiving and accommodating the free sides of the wing sectors of the other section, each wing sector being provided with a channel extending along the free and lateral sides thereof and at least in part providing for strengthening the associated wing sector.

3,924,799
CORRUGATED LAMP BULB WRAPPER

Achim R. Lorenz, Olmsted Township, Ohio, assignor to MacMillan Bloedel Containers, Inc., Cleveland, Ohio

Filed May 23, 1974, Ser. No. 472,655
Int. Cl.[2] B65D *85/42*
U.S. Cl. 229—39 B 8 Claims

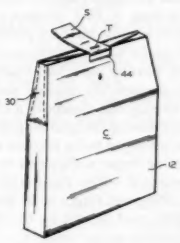


1. A flattened collapsed tube of generally rectangular shape for packaging lamp bulbs formed from a blank comprising a unitary generally rectangular single-faced corrugated sheet having longitudinal corrugations and four regularly spaced parallel transverse crease lines extending across the sheet and dividing the sheet into a glue panel and first, second, third and fourth side wall panels, said glue panel extending from the first side wall panel and adapted to be overlapped at the fourth side wall panel, the glue panel being connected to said first side wall panel along the first of said transverse crease lines, the first and second side wall panels being connected along the second transverse crease line, and the third and fourth side wall panels being connected along the fourth transverse crease line, and eight inclined longitudinal perforated score lines at the opposite ends of said side wall panels which extend between the transverse crease lines at opposite sides of that panel to define triangular flap portions, said score lines being inclined at an angle (C) of from about 50 to about 70 degrees with respect to said transverse crease lines and located so that the wide portions of said triangular flap portions are located at said second and fourth transverse crease lines, said flattened tube being folded only at said last-named crease lines with the first side panel overlying the second side panel, the glue panel adhered to the fourth side panel, and said last-named panel overlying the third side panel.

3,924,800
PILFER RESISTANT PACKAGE

John D. Desmond, Geneva, Ill., and Joseph J. Hart, Philadelphia, Pa., assignors to Container Corporation of America, Chicago, Ill.

Filed Nov. 8, 1974, Ser. No. 522,021
Int. Cl.[2] B65D *5/10, 45/00, 33/26*
U.S. Cl. 229—39 R 6 Claims



1. In a collapsible, retail package formed from a unitary blank of foldable paperboard, the combination of:

a. opposed pairs of front and rear side walls and end walls hingedly interconnected to form a tubular structure open at the top and bottom;

b. at least one bottom closure flap hingedly attached to the lower edge of one of said walls and secured in position to close the bottom of the tubular structure;

c. top closure means for closing the top of the tubular structure after it has been filled, including:

i. a horizontal inner closure flap hinged to an upper edge of one of said side walls and adapted to be folded over the top of said tubular structure;

ii. a horizontal outer closure flap hinged to an upper edge of the other of said side walls and adapted to be folded over said inner closure flap in face to face engagement therewith and including a locking tab extending therefrom;

d. said side walls presenting finger receiving openings adjacent the upper edges thereof;

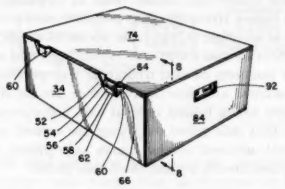
e. said one side wall opening being aligned with said locking tab for receipt thereof;

f. at least one of said openings being located immediately below the upper edge of its respective side wall for receiving a portion of a stapling device to permit a proof of purchase document to be stapled to the overlapped outer and inner closure flaps and said locking tab and thereby render the package tamper resistant.

3,924,801
CARTON FOR REFRIGERATED CONSUMABLE PRODUCTS

James H. Partain, Norcross, Ga., assignor to Stone Container Corporation, Chicago, Ill.

Filed July 11, 1974, Ser. No. 487,625
Int. Cl.[2] B65D *5/02*
U.S. Cl. 229—39 R **12 Claims**



1. A paperboard carton formed from a unitary blank including:

a. an upwardly opening tray having a closure wall hingedly connected along the edge of a first wall of the tray,

b. said closure wall having at least one locking tab depending from a free edge thereof,

c. said tray having a second wall transverse to said closure wall and arranged to be releasably locked therewith for closing the carton,

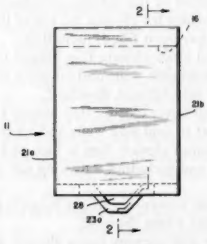
said second wall having at least one locking finger integral therewith having a first portion pivotally attached thereto which is movable to a position flush with said second wall and a second portion extending transverse to said first portion into the interior of carton and adapted to cooperably engage said locking tab for releasably locking the carton in a closed condition,

said second wall having integral hinged flaps adjacent said first portion arranged to be pivoted to a position exposing said locking finger sufficiently to permit same to be manually gripped when flush with the second wall, thereby enabling said finger to be moved relative to the tab for locking and unlocking the closure and second walls one relative to the other.

3,924,802
PLASTIC BAG WITH HANDLES

William Gaffney, Bronx, N.Y., assignor to Charlotte Mintz, New York, N.Y.

Division of Ser. No. 308,293, Nov. 20, 1972, Pat. No. 3,865,018. This application Aug. 2, 1974, Ser. No. 494,203
Int. Cl.[2] B65D *33/10*
U.S. Cl. 229—54 R **3 Claims**

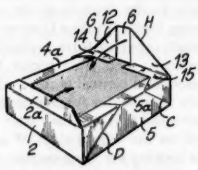


1. A bag comprising a bag body of thermoplastic sheet material, having first and second superimposed walls, said walls being connected at their lower edges to form a closed bottom and at their sides, said bag body being open at its other end to form a mouth, and a pair of handles of thermoplastic sheet material each consisting of aligned outwardly projecting end portions, portions extending from the inner ends of said end portions converging beyond said bag body and a central portion parallel to said end portions interconnecting the outer ends of said converging portions, said portions of each handle lying in a common plane, said end portions of said handles being fused to said walls, respectively, and located between said walls, said central portions of said handles being spaced from said mouth to provide hand holes for said handles, said handles having parallel inner and outer edges across the full length of said handles and having the same widths throughout when measured in a direction from the bottom to the mouth of the bag body so that said handles can be cut from a web without waste.

3,924,803
EASY-OPENING PACKAGING FOR MELTED OR SEMI-IQUID SUBSTANCES

Dominic de Habsburg, Berndorf, Austria, assignor to Samos, France

Continuation-in-part of Ser. No. 262,258, June 13, 1972, abandoned. This application Apr. 24, 1974, Ser. No. 463,733
Claims priority, application France, June 14, 1971, 71.21442
Int. Cl.[2] B65D *45/06*
U.S. Cl. 229—87 F **4 Claims**



1. A container, for meltable or semi-liquid substances, comprising, in combination, a first sheet of flexible material having only one surface which is weldable to similar material; said surface facing the interior of said container said first sheet defining, through rectilinear fold lines, a polygonal container bottom and container sides extending perpendicularly upwardly from said bottom at the fold lines defining said bottom; said container sides having rectilinear fold lines in spaced parallel relation to said bottom and defining respective edge flaps at their upper edges, a second sheet of flexible material having only one surface which is weldable to similar material, said surface facing outwardly of said container said second sheet being congruent with said bottom and positioned on top of a substance filled into said container to the level of the fold lines defining said edge flaps; one of said edge flaps being wider than the other edge flaps and being folded on itself to form triangular double thickness end portions separated by a single thickness rectangular portion whereby said one edge flap is trapezoidal; the contacting surfaces of said double thickness end portions being welded only to each other; said other edge flaps being folded against and welded to said second sheet and said one edge flap being folded over said second sheet with only said single thickness rectangular portion welded thereto; said one edge flap constituting a pull tab, reinforced by said double thickness end portions not welded to said second sheet for tearing away at least the major portion of the side wall having said one edge flap and at least the major portion of said bottom to expose the filled-in substance.

3,924,804

CENTRIFUGE FOR THE SEPARATION OF MIXTURES OF LIQUIDS

Heinrich Niemeyer, Oelde, Germany, assignor to Wesfalia Separator AG, Oelde Westfalen, Germany

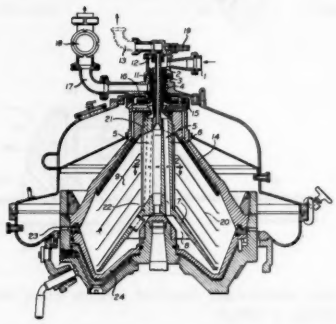
Filed Dec. 6, 1973, Ser. No. 422,467

Claims priority, application Germany, Dec. 12, 1972, 2260617

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] B04B *11/06*

U.S. Cl. 233—19 A 5 Claims



1. A centrifugal separator for separating a liquid raw material into a specifically lighter component and a specifically heavier component, comprising:

a. a rotatably mounted separator drum providing a separating chamber for the separation and having a distributor coaxially mounted therein for rotation with the drum for receiving material to be separated in the upper part of the drum and conveying it downwardly adjacent the drum axis and directly it radially outwardly adjacent the bottom of the drum,

b. the distributor comprising a plurality of axially extending ribs disposed adjacent and radially outwardly of the axis of the drum in circumferentially spaced relation, the ribs having passages therein for conveying of raw material to the lower part of the drum, the spaces between the ribs providing free communication between the separating chamber and an axially extending center portion of the drum for passage of specifically lighter component to said center portion of the drum,

c. an inlet tube mounted on the distributor for rotation therewith for conveying raw material downwardly into the drum to said passages of the ribs, and a stationary inlet connector for delivering of raw material to the upper end of the inlet tube, and a hermetic seal between the inlet tube and stationary inlet connector,

d. an outlet tube for specifically lighter component mounted on the distributor for rotation therewith for conveying specifically lighter component upwardly from the said center portion of the drum, said outlet tube being disposed within said inlet tube, and a stationary outlet connector for receiving specifically ligher component from the outlet tube, and an hermetic seal between the outlet tube and stationary outlet connector,

e. a paring chamber and paring disc for removal of specifically heavier component, means communicating the paring chamber with the outer portion of the drum for receiving specifically heavier component therefrom, a discharge line communicating with the paring disc, and a throttle in said discharge line.

3,924,805

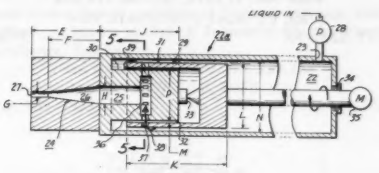
METHOD AND APPARATUS FOR PRODUCING AND UTILIZING PERCUSSIVE LIQUID JETS

Eugene B. Nebeker, Los Angeles, and Sergio E. Rodriguez, Woodland Hills, both of Calif., assignors to Scientific Associates, Inc., Santa Monica, Calif.

Filed Oct. 29, 1974, Ser. No. 518,606

Int. Cl.[2] B05B *1/08, 17/00;* B44D *1/08*

U.S. Cl. 239—1 5 Claims



1. A method for creating a percussive liquid jet from a continuous jet discharge consisting of producing a relatively small cyclic variation of the discharge velocity about its time average, whereby the free jet is given a lengthwise variation in forward velocity compelling the free jet to become a bunched stream with a change in lateral diameter occurring periodically along the length of the stream.

3,924,806

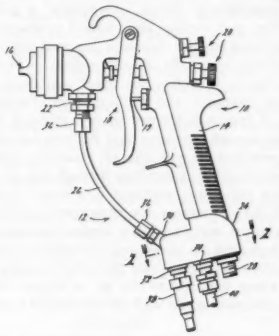
MIXING MANIFOLD FOR AIR ATOMIZING SPRAY APPARATUS

Duane C. Schowiak, Farmington Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 20, 1974, Ser. No. 525,596

Int. Cl.[2] B05B *7/04*

U.S. Cl. 239—8 4 Claims



1. A method of operating an air atomizing spray apparatus for spraying a multiple component sprayable fluid coating from an air atomizing spray apparatus wherein the components begin to coreact upon mixing to form a cross-linked coating and wherein the air atomizing spray apparatus is provided with an air passage having an inlet port communicating with a source of pressurized air and terminating in a spray nozzle and a sprayable fluid inlet passage communicating with the air passage intermediate the spray nozzle and the inlet port comprising the steps of:

establishing a flow of atomizing air through said air passage;

causing each of the fluid components to flow, separately, to a fluid introduction manifold;

introducing the components, while flowing, into a unitary fluid flow passage;

flowing the fluid components through a static mixer wherein the fluid components will become intimately intermixed; and

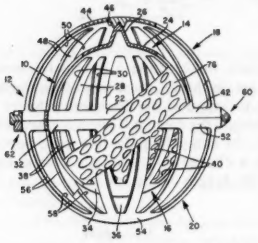
introducing said intimately intermixed fluid components into the sprayable inlet passage of the spray apparatus.

3,924,807

HUMIDITY ALTERING DEVICE

Leonora Elizabeth Nash Morgan, 3700 - 14th St., Moline, Ill. 61265

Filed Nov. 1, 1974, Ser. No. 519,818
Int. Cl.² A24F *25/00;* **A61L** *9/04*
U.S. Cl. 239—55 **3 Claims**



1. A humidifying device comprising: a pair of similarly shaped, first and second, thin walled containers, the second container being smaller than and disposed centrally within the first container, the walls of said containers being disposed in spaced relation to define the inner and outer surfaces of a hollow air chamber, the walls of said containers having a plurality of apertures formed therein through which the interior of the second container and the exterior of the first container communicate with the air chamber; upper and lower connecting members extending through the air chambers and connecting the upper portions and lower portions, respectively, of the containers for maintaining said containers in spaced relation; and a moisture abssorbent element contained within the second container and externally shaped to conform substantially with the interior thereof, the outer surface of the element being exposed to the air in the air chamber at the apertures formed in the wall of the second container.

3,924,808

SHOWER HEAD VIBRATOR

Howard H. Cooley, Jr., 11685 Gorham Ave., Los Angeles, Calif. 93534

Filed Dec. 17, 1973, Ser. No. 425,210
Int. Cl.² B05B *3/16;* **A61H** *9/00*
U.S. Cl. 239—102 **5 Claims**

1. A shower head vibrator for vibrating the spray of water from a shower head to provide a massaging effect, said vibrator comprising:

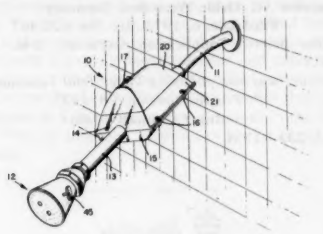
a. a section of flexible tubing for connection between a water pipe and a shower head,

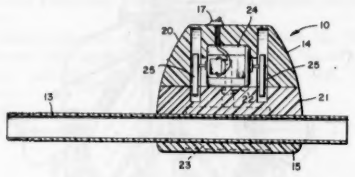
b. a housing mounted to the exterior of said flexible tubing,

c. an electric motor disposed within said housing and having a shaft,

d. two circular weights disposed within said housing and eccentrically mounted to said shaft, and

e. battery means disposed within said housing for energizing said motor, thereby causing said shaft to rotate, whereby





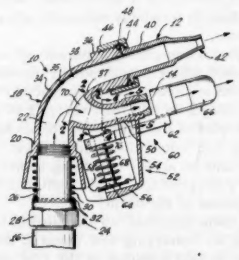
said eccentrically mounted weights cause said flexible tubing to vibrate.

3,924,809

CONSTRUCTION FOR REDUCING VORTEX SWIRL IN ROTARY WATER SPRINKLERS

Edward M. Troup, Glendora, Calif., assignor to Rain Bird Sprinkler, Mfg. Corporation, Glendora, Calif.

Filed July 3, 1974, Ser. No. 485,504
Int. Cl.² B05B *3/08*
U.S. Cl. 239—230 **10 Claims**



1. In a rotary water sprinkler of the type including a body having a lower portion defining an inlet water passage for receiving water from a supply pipe, a curved central portion extending upwardly and laterally from the lower portion and within which is a curved central flow passage defined by a rear wall having an outer radius of curvature and a forward wall having an inner radius of curvature, and an upper portion extending from the central portion, a range nozzle attached to the upper portion of the body for ejecting a stream of water over a relatively long distance, and a spreader nozzle attached to the central portion of the body for ejecting a stream of water over a shorter distance, the improvement comprising:

forming said central flow passage as a uniformly and upwardly converging passageway of substantially circular cross section whereby water flowing through said passage is accelerated in the longitudinal direction of flow; and

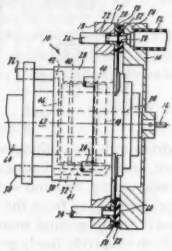
providing a bleed opening through said forward wall below said range nozzle and positioned to bleed swirling water particles from the flow through said central flow passage and to channel said swirling water particles to said spreader nozzle whereby the amount of swirling water in the stream ejected through said range nozzle is substantially reduced.

3,924,810

SPRAYABLE MATERIAL CHANGER APPARATUS

Charles H. Otterstetter, Southgate, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 4, 1974, Ser. No. 520,759
Int. Cl.² A62C *31/00*
U.S. Cl. 239—305 **5 Claims**



1. Apparatus for communicating a powder spray gun with a plurality of fluidized powder sources while avoiding cross contamination of powders comprising in combination:

a stationary plate member having a powder side and a sealing side, a plurality of powder passages and at least one flushing passage, said passages extending through said plate from the powder side to the sealing side;

hose means coupled to said powder passages on the powder side of said plate for fluid-tight communication of said powder passages with the plurality of powder sources;

further hose means coupled to said at least one flushing passage on the powder side of said plate;

means coupled to said further hose means for flowing a flushing medium therethrough;

plate valve means supported in closely spaced relation to said stationary plate member and having a flow passage means extending through said plate valve means and aligned for fluid communcation with said powder passage and said at least one flushing passage;

hose means coupled to said flow passage means for communicating said flow passage means with the spray gun;

means connected to said valve plate means for varying the spatial relation between said valve plate means and said stationary plate member;

indexing means operative to align said flow passage with a selected one of said powder and flushing passages;

seal means interposed between said stationary plate member and said valve plate means operative to provide sealed communication between said flow passage and said selected one of said powder and flushing passages;

said plate valve means comprising a plate member mounted for rotation about an axis, said rotation axis being arranged to extend through the stationary plate member, and said spatial relation varying means comprise cylinder means interconnecting said stationary plate member and said plate valve means actuable to increase the spatial relation to a first predetermined amount and to decrease the spatial relation to a second predetermined amount; and

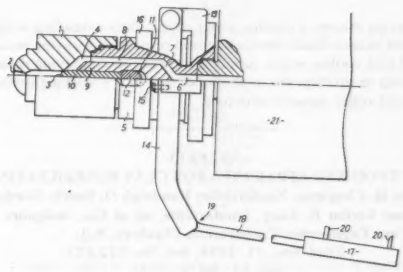
said indexing means comprising step motor means operative when the spatial relation between the stationary plate member and the valve plate means is at the first predetermined amount to rotate said valve plate means about said axis until said flow passages is aligned with the selected one of the powder and flushing passages and to actuate said piston means to establish a spatial relation of the second predetermined amount.

3,924,811

SHUT-OFF VALVES FOR THE NOZZLES OF INJECTION MOULDING MACHINES

Graham Lynex, Pelsall, and Harold Tranter, Aldridge, both of England, assignors to British Industrial Plastics Limited, Manchester, England

Filed Dec. 6, 1974, Ser. No. 530,488
Int. Cl.² B29F *1/03*; B05B *1/30*
U.S. Cl. 239—533 **1 Claim**



1. A nozzle device for an injection moulding machine, comprizing a nozzle portion and a valve body portion, a bore being defined in the nozzle and a throat being defined in the bore, a flow distributor being formed in the valve body portion to define therewith at least one passageway communicating with the bore, a valve member carried in the flow distributor and freely slidable axially relative thereto to open and close the throat, a transverse opening in the flow distributor, a key in the opening co-operating with the valve member, an axially slidable collar on the valve body portion co-operable with the key, a thrust assembly mounted on the valve body portion, and a fluid pressure-operable device mountable on an injection moulding machine and arranged and adapted to co-operate with the thrust assembly so that the fluid pressure device is operable to effect movement of the valve member to close the throat, and wherein the valve member has a downstream end profiled so that when moulding material is pressurized in the passageway of the valve body, a component of the pressure force acts in an axial direction with respect to the valve member to tend to move same to open the throat.

3,924,812

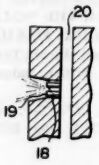
APPARATUS FOR SUPPORTING AND GUIDING SLAB IN THE SECONDARY COOLING ZONE OF CONTINUOUS CASTING MACHINE

Minoru Miura, Minoo; Morio Kawasaki, Nishinomiya; Kantaro Sasaki, Ashiya; Yasuo Sugitani, Takarazuka, and Susumu Ishimura, Nishinomiya, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Oct. 2, 1974, Ser. No. 511,268
Claims priority, application Japan, Oct. 4, 1973, 48-111037; Nov. 12, 1973, 48-126342
Int. Cl.² B05B *1/14*
U.S. Cl. 239—550 **3 Claims**

1. An apparatus for supporting and guiding a slab in at least part of the secondary cooling zone of a continuous casting machine, which comprises at least one pair of stationary roller support structures each having a surface spaced a constant distance from a corresponding surface of the slab being withdrawn, and rollers carried by said roller support structure and adapted to roll over an endless surface of said roller support

structure with the descent of the slab, said rollers being adapted to proceed along the gap between the associated roller support structure and the slab, each said roller having a diameter equal to the relevant dimension of said gap, each said roller support structure having a number of cooling water



spraying means, a cooling water supply duct extending within it and branch ducts connecting said respective spraying means and said cooling water supply duct, each said spraying means having its tip disposed on the inner side of the working surface of said roller support structure.

3,924,813

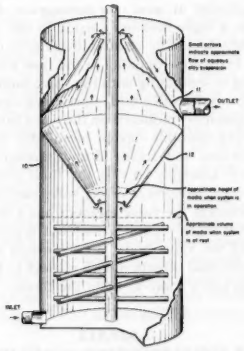
METHOD AND APPARATUS FOR CLAY BENEFICIATING

John H. Chapman, Sandersville; Randolph O. Smith, Gordon, and Verlon E. Josey, Sandersville, all of Ga., assignors to Yara Engineering Corporation, Elizabeth, N.J.

Filed Nov. 11, 1974, Ser. No. 522,523

Int. Cl.² B02C *17/16*

U.S. Cl. 241—4 **7 Claims**



1. A method of clay beneficiating comprising the steps of:

a. forming a aqueous slurry of clay to be beneficiated having a clay concentration of about 10% to 60% in the slurry;

b. passing said clay slurry through a media grinder operating at a speed in the range of 200 rpm to 800 rmp and having therein a finely divided, relatively dense grinding media having a particle size in the range 325 mesh to 40 mesh;

c. maintaining a relative ratio of clay in said slurry to grinding media in said media grinder in the range 1.5:1 to 1:1.5;

d. maintaining a level of slurry in said grinder sufficiently high so that the grinding media is retained in the grinder; and

e. recovering the ground clay from the grinder.

3,924,814

ARRANGEMENT IN GRINDING MILLS

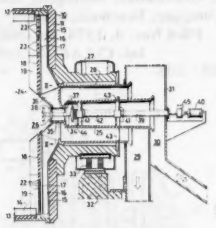
Per Anders Herman Henningsson Fahlström, Akers Runo, and Erik Alfon Jonsson, Boliden, both of Sweden, assignors to Boliden Aktiebolag, Sweden

Filed Aug. 23, 1974, Ser. No. 499,918

Claims priority, application Sweden, Feb. 27, 1974, 7402593

Int. Cl.² B02C *17/18*

U.S. Cl. 241—80 **7 Claims**



1. A device in a drum mill for continuous grinding and of the type including an essentially cylindrical casing and end walls, at the ends of said casing, one end wall being associated with outlet means for discharging from the grinding chamber of said mill a relatively finely ground material and a mixed material containing both relatively finely ground material and relatively coarse pieces of material, at least the outlet means for the mixed material including a number of outlet openings connecting the grinding chamber with at least one duct for carrying the mixed material discharged from the grinding chamber towards the centre of said one end wall, wherein said duct in the central region of said one end wall opens out into a discharge pipe which is associated with a two-way valve for conducting the mixed material arriving from said duct either back again to, or in a direction from the grinding chamber and which shields the outgoing flow of mixed material from the flow of relatively finely ground material discharged from the grinding chamber.

3,924,815

GYRATORY CRUSHER

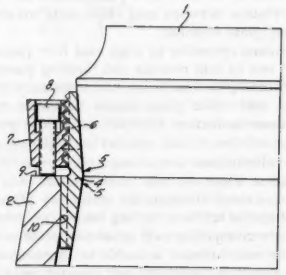
Erik Haggren, Morgardshammar, Sweden, assignor to Morgardshammar AB, Stockholm, Sweden

Filed Feb. 14, 1974, Ser. No. 442,585

Claims priority, application Sweden, Feb. 19, 1973, 7302292

Int. Cl.² B02C *2/06*

U.S. Cl. 241—209 **8 Claims**



1. In a gyratory crusher comprising a crusher shaft for performing eccentric or epicyclic movement in a vertical crusher space, a crusher member clamped on the crusher

shaft, and means including a stopnut for clamping said member on said shaft, the improvement wherein said stopnut is attached to a sleeve encircling said shaft, the inner surface of said sleeve defining substantially the shape of a truncated double cone with the inner surface of said sleeve tapering radially inwardly as the inner surface extends axially from the opposite ends of the sleeve, said sleeve being located on a portion of said crusher shaft having a double-cone shape corresponding to said shape defined by said inner surface and said sleeve having external threads for engaging the threads of said stopnut.

3,924,816

APPARATUS FOR FORMING WINDINGS ON ROTORS OF ELECTRIC MOTORS OR THE LIKE

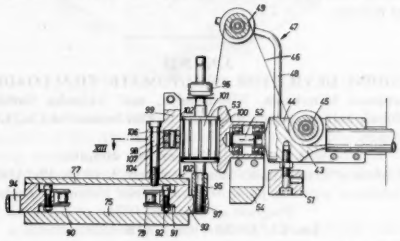
Klaus Schubert, Bottrop, and Klaus Grohmann, Dusseldorf, both of Germany, assignors to Robert Krups, Solingen-Wald, Germany

Continuation-in-part of Ser. No. 218,783, Jan. 18, 1972, abandoned. This application Apr. 10, 1974, Ser. No. 459,689

Claims priority, application Germany, Jan. 19, 1971, 2102354

Int. Cl.² H02K *15/09*

U.S. Cl. 242—7.05 B **38 Claims**



1. Apparatus for applying windings to rotors for use in electric motors or the like and having angularly spaced peripheral slots for reception of convolutions of wire-like conductors, comprising conveyor means having a plurality of rotor-receiving holder means operative for holding a plurality of rotors having random angular orientations, said holder means being arranged to travel stepwise along an endless path and drive means for said holder means; a plurality of winding stations adjacent to a portion of said path to accommodate an equal number of rotors during intervals between stepwise movements of said holder means, and including means for automatically changing the random angular orientations of rotors arriving at said winding stations to a predetermined angular orientation; sources of conductors for each of said stations; winding members provided at said stations and operable to apply conductors furnished by the respective sources to rotors at the corresponding stations; and means for simultaneously operating said winding members so that the number of simultaneously wound rotors equals the number of said stations.

3,924,817

APPARATUS FOR PACKAGING LINEAR MATERIAL

Alex P. Symborski, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toldeo, Ohio

Filed Dec. 3, 1973, Ser. No. 421,362

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² B65H *54/02*

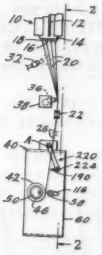
U.S. Cl. 242—18 G **18 Claims**

1. Apparatus for packaging linear material comprising:

a rotatable collector upon which linear material is wound in a zone as a package;

means for rotating the collector; and

means effective to move the linear material between the package formation zone along the collector and a temporary winding zone, such means including a movably mounted member having a slot open at one end, the slot being oriented so that its lengthwise dimension extends in a direction transversley of the axis of rotation of the collector with the open end thereof facing towards the collector, the member providing a pair of spaced apart opposing guide surfaces for facilitating movement of the linear material into the slot, such guide surfaces diverging from the open end of the slot to form a tapered guide



space open at its larger end for introduction of the linear material, the guide space communicating at its smaller end with the slot, means for moving the member at the beginning of package build along a path effective to move linear material in the slot from collection at the temporary winding zone into the package formation zone and for moving the member laterally of the axis of rotation away from the collector to disengage the linear material from the slot during package formation member at the end of package formation laterally of the axis of rotation towards the collector to engage the linear material in the slot and for moving the member along a path effective to move such material in the slot out of the package formation zone.

3,924,818

THREAD STORAGE DEVICE

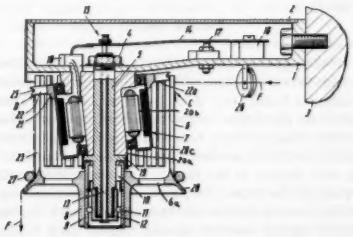
Dieter Pfeifle, Plattenhardt, Germany, assignor to SKF Kugellagerfabriken GmbH, Schweinfurt, Germany

Filed Feb. 19, 1974, Ser. No. 443,832

Claims priority, application Germany, Feb. 20, 1973, 2308203; Oct. 11, 1973, 2350979

Int. Cl.² B65H *51/22*

U.S. Cl. 242—47.05 **27 Claims**



3. Apparatus for the intermediate accumulation of thread being delivered from a supply thereof to a processing station comprising a disc rotatable about its central axis having a

peripheral edge for receiving thread from said supply, a cylindrical storage member rotatable about its central axis having a peripheral surface on which said thread is wound, said disc being arranged adjacent one edge of said storage member, having its axis of rotation inclined to and laterally offset from the axis of rotation of said storage member and its peripheral edge extending radially beyond at least a portion of the peripheral surface of said storage member, means for conjointly rotating said disc and said storage member, said peripheral edge having a lateral face adapted to urge said thread to wind about the peripheral surface of said storage member into a coil and to urge said coil to move axially along the peripheral surface of said storage member to the upper end of said member for withdrawal to said processing station.

3,924,819

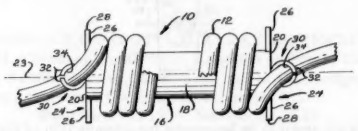
ELECTRICAL UTILITY CORD STORAGE AND SHORTENING DEVICE

Edward F. Lapinskas, 4315 S. Harlem Ave., Stickney, Ill. 60402

Filed June 11, 1974, Ser. No. 478,218

Int. Cl.[2] B65H *75/36*

U.S. Cl. 242—85.1 **4 Claims**



1. A spool-like device adapted for use in wrapping, storing, and shortening utility cord or the like comprising a generally longitudinally extending tubular member having an outer peripheral surface upon which the cord is adapted to be wrapped, at least one pair of generally transversely extending retaining flanges connected to and located adjacent opposite ends of said tubular member and projecting generally radially outwardly from said outer peripheral surface by a distance sufficient to contain at least one winding of the wrapped cord by preventing axial separation thereof, and resilient clip means connected to and located at each said ends of said tubular member having separated jaw portions which partially define an opening for the cord and which snap about the cord whenever the cord is inserted into said opening to firmly hold the cord against unwrapping about said tubular member.

3,924,820

ARRANGEMENT FOR EQUALIZING THE TENSION OF TWO SUPPLIED THREADS

Stanislav Kovar; Jiri Cernocky, and Petr Riha, all of Vsetin, Czechoslovakia, assignors to Zbrojovka Vsetin, narodni podnik, Vsetin, Czechoslovakia

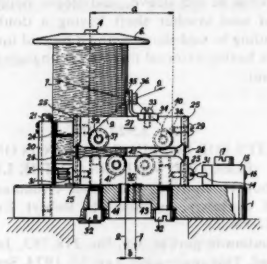
Filed May 7, 1974, Ser. No. 467,665

Claims priority, application Czechoslovakia, May 7, 1973, 3230-73

Int. Cl.[2] B65H *59/04*

U.S. Cl. 242—156 **4 Claims**

1. Arrangement for equalizing the tension of two supplied threads taken off from individual bobbins, comprising in combination a frame, two thread-carrying bobbins rotatably supported on the frame, a grooved braking disc affixed to each bobbin, braking wires received within the grooves of the respective bobbins, anchoring means for one end of each braking wire affixed to the frame, a two-arm lever rotatably supported on the frame, one arm of said lever serving as an anchoring means for the second ends of both braking wires, a tension spring inserted in one end of each braking wire, a bridge supported for oscillation on the frame, a guiding roller for each thread on opposite sides of said bridge, a drawing-in roller for each thread on a support affixed to the frame, outlet eyelets for the thread fixed on the said support, and means pivotally connecting the bridge to the second arm of the lever so that turning of the lever in one direction by the movement of the bridge in a first direction increases the braking effect of a first wire on the braking disc of the first bobbin while decreasing the braking effect of the second wire on the braking



disc of its respective bobbin, and turning of the lever in the other direction by the movement of the bridge in a second direction increases the braking effect of the second wire on the braking disc of the second bobbin while decreasing the braking effect of the first wire upon the braking disc of the first bobbin.

3,924,821

GUIDING DEVICE FOR AN AUTOMATIC FILM LOADER

Yoshinari Minakawa, Nishinomiya, and Akinobu Sashida, Itami, both of Japan, assignors to Eiki Industrial Co., Ltd., Japan

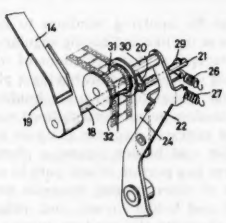
Filed Oct. 10, 1973, Ser. No. 405,160

Claims priority, application Japan, Feb. 3, 1973, 48-14167

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] G03B *1/04*; **G11B** *15/32*

U.S. Cl. 242—195 **5 Claims**



1. A device for guiding a film strip to a takeup reel of a projector and the like, comprising:

means provided in said takeup reel for automatically taking up the leading end of the film strip;

an elongated guide plate means for guiding the leading end of the film strip toward a core of the takeup reel, said elongated guide plate means pivotally mounted on the projector and adapted to be positioned within said takeup reel and to withdraw therefrom;

a link member pivotally mounted on said projector;

holding means operatively coupled to said link member for releasably holding said guide plate means within said takeup reel, whereby the leading end of the film is directed toward the core of the takeup reel;

spring means interposed between said link member and said projector and cooperating with said holding means; and

guide roller means for guiding the film strip to said guide plate means, said guide roller means rotatably mounted on said link member, said link member adapted to pivot

toward said guide plate means against said spring means due to tension of the film strip acting on said guide roller means when the leading end of the film strip is taken up by the core of the takeup reel, thereby releasing said guide plate means from said holding means, whereby said guide plate means pivotally withdraws from said takeup reel.

3,924,822

CARTRIDGE FOR RECORDING MEDIA

Manfred Moessner, Eppelheim, and Gerhard Kreutze, Bammental, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengellschaft, Ludwigshafen (Rhine), Germany

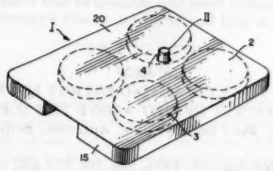
Filed Mar. 8, 1973, Ser. No. 339,059

Claims priority, application Germany, Mar. 13, 1972, 7209493

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] G03b *1/04*; **G11b** *15/32, 23/04*

U.S. Cl. 242—198 **7 Claims**



1. For use in connection with a recording and/or playback apparatus of the type having driving means including spindles, having recording-media-scanning means and having a cartridge-locking and/or -unlocking mechanism controlled by a manually operable member,

a cartridge having

a substantially rectangular housing with a bottom wall, a top wall and side walls,

two pairs of spools designed to carry packs of recording media in the form of strips, the first for the recording of visual information and the second for the recording of audio information, and

means for guiding said strips,

at least one of said side walls having apertures designed to permit passage therethrough of said scanning means and said bottom and top walls having mutually facing openings disposed between the locations of said spools and said strips and designed so that, with the cartridge placed in position on said apparatus, said member projects through at least one of said openings and is accessible for manual operation from outside of said apparatus and said cartridge.

3,924,823

CARTRIDGE DRIVE

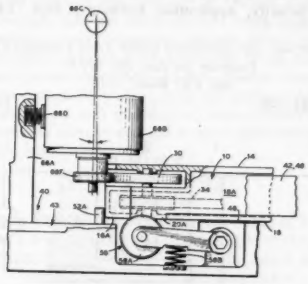
William D. Cohen, Huntington, and John J. Darcy, Brentwood, both of N.Y., assignors to Redactron Corporation, Hauppauge, N.Y.

Filed June 26, 1974, Ser. No. 483,412

Int. Cl.[2] G03B *1/04*; **G11B** *15/32, 23/04*

U.S. Cl. 242—198 **10 Claims**

1. A deck for a cartridge having a tape mounted on two reels which are driven to rotate by the rotation of a drive puck located at the front end of the cartridge, said deck comprising a magnetic head, a base structure and a bed plate assembly, a pair of side guides on said bed plate, each of said guides having a side wall and a top wall for cooperating with said bed plate to guide a cartridge into an operative position with respect to said magnetic head, a motor support means extending upward from the top surface of the base structure nearest a loaded cartridge, a drive motor, a capstan on the shaft of said drive motor, means for pivotably mounting said drive motor on said support means to extend downwardly toward said surface of said base structure and bed plate so that said



capstan will be opposite the drive puck of a loaded cartridge and biasing means for urging said drive motor to pivot toward a loaded cartridge whereby said capstan is in forced contact with the drive puck of a loaded cartridge.

3,924,824

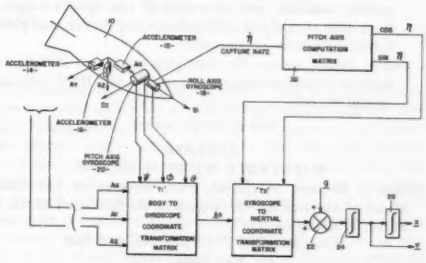
CROSS TRACK STRAPDOWN INERTIAL QUIDANCE SYSTEM

Peter M. Brodie, Oakland, and Edwin G. Solov, Wayne, both of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Oct. 17, 1973, Ser. No. 407,121

Int. Cl.[2] F42B *15/02*; **F41G** *7/00*

U.S. Cl. 244—3.2 **5 Claims**



1. A strapdown inertial guidance system for a vehicle, comprising:

a first accelerometer mounted in said vehicle for producing an output signal (A_Y) representing the acceleration of said vehicle along a heading axis;

a second accelerometer mounted in said vehicle for producing an output signal (A_X) representing the acceleration of said vehicle along a cross-heading axis perpendicular to said heading axis;

a third accelerometer mounted in said vehicle for producing an output signal (A_Z) representing the acceleration of said vehicle along a Z-axis perpendicular to said heading and cross-heading axes;

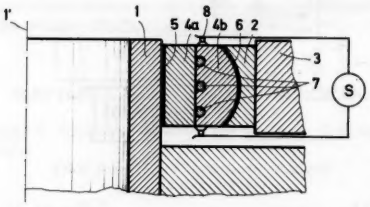
roll axis gyroscope means captured loosely about null mounted on said vehicle to produce output signals representing the pitch angle (θ) and the rate of angular rotation (η) about the roll axis of the vehicle; and

pitch axis gyroscope means mounted on said vehicle to produce output signals representative of the yaw angle (Ψ) and of the roll angle (ϕ) of the vehicle.

3,924,825
PLASTIC BEARING

Reiner Peschke, Ottobrunn, Germany, assignor to Messerschmitt-Bolkow-Blohm G.m.b.H., Munich, Germany

Filed Sept. 8, 1972, Ser. No. 287,270
Claims priority, application Germany, Sept. 14, 1971, 2145771
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] B64C *3/38*
U.S. Cl. 244—46 **11 Claims**



1. In a bearing assembly particularly for rotatably supporting shaft means of a movable wing on an aircraft to effect a variation in the amount of sweepback, said bearing assembly having means defining a freely rotatable spacer positioned between said shaft means and a frame structure of said aircraft, said spacer means thereby defining a pair of radially spaced interfaces, and plastic lubricating layer means positioned between one of said pair of interfaces and in engagement with said spacer means and with one of said shaft means and said frame structure, the improvement comprising:

means defining a passageway in said spacer means intermediate said pair of interfaces; and

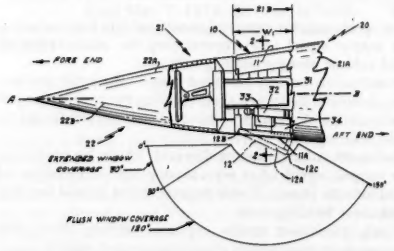
means defining a heating medium in said passageway means for effecting a uniform, homogeneous heat travel both radially inwardly and outwardly of said spacer means to heat both of said pair of interfaces and thence said plastic lubricating layer means; and

energy supply means for supplying energy to said heating medium in said passageway means in said freely rotatable spacer means.

3,924,826
ROTATABLE WINDOW MEANS

Milton J. Reinert, Florissant, Mo., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 20, 1974, Ser. No. 535,060
Int. Cl.[2] B64C *1/14*
U.S. Cl. 244—129 W **4 Claims**



1. A window means, adapted for use with an aircraft having a roll axis, a fore end, an aft end, and a fuselage with an aerodynamically configurated nose section having an external surface and an interior, wherein said fuselage has an external surface with an incomplete portion therein immediately aft of the nose section, with said incomplete external surface portion of the fuselage being of a preselected band-like shape having a uniform width completely around the fuselage, comprising:

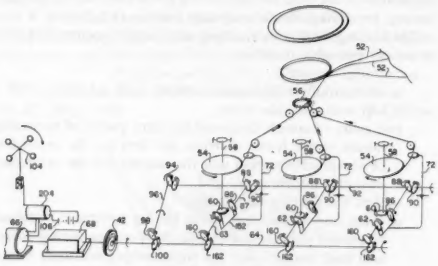
a. rotatable, complete band of suitable material encircling the fuselage immediately aft of the nose section, fitted within and conforming with the shape of the incomplete external surface portion of the fuselage, and mounted flush with, and aerodynamically configurated to conform to, the external surface of the nose section, with said rotatable band having an opening therein;

b. and, a window envelope that is operatively associated with said rotatable band and which includes a windowpane of transparent material fitted into, disposed in a flush manner within, and occupying the entire said opening in said rotatable band, with said windowpane shaped to conform to the aerodynamic configuration of said rotatable band and having a fore end edge and an aft end edge, and with said windowpane suitably connected at said fore end edge thereof to said rotatable band opening, thereby permitting the selective opening of said windowpane outwardly from said opening of said rotatable band from and at said fore end edge of said windowpane.

3,924,827
APPARATUS FOR EXTRACTING ENERGY FROM WINDS AT SIGNIFICANT HEIGHT ABOVE THE SURFACE

Lambros Lois, 4857 Battery Lane, Apt. 406, Bethesda, Md. 20014

Filed Apr. 25, 1975, Ser. No. 571,632
Int. Cl.[2] B64C *31/06*
U.S. Cl. 244—153 R **16 Claims**



1. Apparatus for harnessing energy from atmospheric winds, comprising a plurality of floating wings, each wing being connected to a flexible line, the other end of each flexible line being wound upon a respective pulley, means including shaft means connecting said pulleys to energy utilization means for utilizing energy extracted from the wind by playing out of said lines and said wings under the influence of the wind, and means to reverse the direction of rotation of the pulleys in sequence to sequentially retract a wing and its respective line.

3,924,828
PAN, TILT AND ROLL TRIPOD HEAD

Victor R. Epperson, 2545 Havencrest Drive, Fallbrook, Calif. 92028

Filed Dec. 23, 1974, Ser. No. 535,724
Int. Cl.[2] F16M *11/12*
U.S. Cl. 248—179 **3 Claims**

1. A pan, tilt and roll tripod head, comprising:

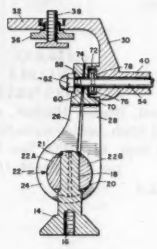
a base having means for attachment to a tripod, said base having an upright post thereon;

a cylindrical, diametrically split trunnion rotatably mounted on said post for panning motion about one axis;

a clamp bracket journalled on said trunnion for tilt motion about another axis perpendicular to the post, said clamp bracket being split and having extended, normally separated arms;

a head bracket pivotally mounted on the end of said arms remote from the trunnion for motion about a roll axis orthogonal to the pan and tilt axes;

frictional locking means including a substantially cylindrical plug on said head bracket, and a socket in one of said clamp bracket arms to receive the plug, said plug and socket having a corresponding axial taper converging to the inner end of the socket;



clamp means including a clamp rod passing through said plug and said clamp bracket arms and having a clamp nut bearing against the other of said arms, and a spring coupled to the clamp rod to bias said arms together and lock said plug frictionally into said socket;

a trigger connected to said clamp rod for axial movemment of the clamp rod against said spring to release clamping pressure on said clamp bracket;

and locking release means between said head bracket and said clamp bracket, operable by movement of the clamp rod beyong that required to release clamping pressure on the clamp bracket, to unlock the plug from frictional grip in the socket.

3,924,829

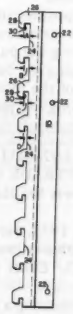
EVEN LOAD CLIP

Bruce K. Boundy, Holland, Mich., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 18, 1974, Ser. No. 434,749

Int. Cl.[2] A47F *5/08;* **A47G** *29/02*

U.S. Cl. 248—243 **2 Claims**



1. A mounting bracket for connecting a cantilevered load to a slotted standard, said mounting bracket comprising;

a body portion constructed and arranged to be connected to the load to be supported,

a plurality of linearly aligned hook connectors extending from one edge of said body portion, said hook connectors including a shank portion and a hook portion with the shank portion defining the distance between the hook portion and said one edge of said body portion, said distance between said hook portion and said body portion being of a predetermined non-uniformity with respect to at least some of said plurality of linearly aligned hook connectors and said shank portion being largest for the uppermost hook connector and the shank portions of each adjacent lower hook connector being, for the next several hook connectors, slightly smaller than the connector immediately above with the shank portions of the remainder of said plurality of hook connectors being uniform to thereby provide a more uniform distribution of said cantilevered load.

3,924,830

SYSTEM FOR RIGIDLY FIXING AN OBJECT TO A SUPPORT BY MEANS OF THERMALLY INSULATING TENSION TIES, MORE PARTICULARLY FOR ASTRONOMICAL RADIOMETERS

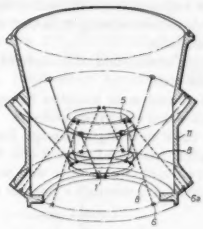
Maurice A. Collard, Le Chesnay; Serge Alfred Cruchant, Bagneux, and Jean-Louis Lafon, Trappes, all of France

Filed Apr. 30, 1974, Ser. No. 465,597

Claims priority, application France, May 4, 1973, 73.16106

Int. Cl.[2] F16L *15/04*

U.S. Cl. 248—358 A **12 Claims**



1. A system for securing an object, which is revolution-shaped around an axis, to a surrounding, coaxial support, said object being moreover symmetrical with respect to a reference median plane perpendicular to said axis, said system comprising individual tension ties formed in groups of four ties which each include two pairs of tension ties that are symmetrical to each other with respect to said reference plane, each tension tie connecting an anchorage point on the object to an anchorage point on the support, the anchorage points of one pai: on the object being spaced and the anchorage points of the same one pair on the support being also spaced, but by a greater distance than the former anchorage points, said groups of four tension ties being equally distributed around said axis.

3,924,831

FLUID COUPLING

John Andrich, M. R. No. 5, Titusville, Pa. 16354

Filed Nov. 18, 1974, Ser. No. 524,667

Int. Cl.[2] F16L *37/28*

U.S. Cl. 251—149.7 **1 Claim**

1. A coupling comprising a male member,

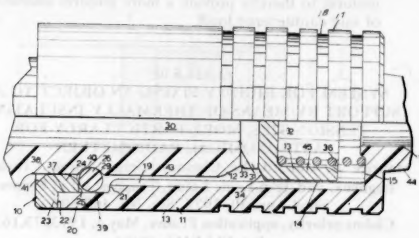
a hollow female member having a first end and a second end,

means adapted to connect a source of fluid to said second end of said female member,

said female member having a bore extending therethrough defining said hollow and a counterbore in the said first end of said female member defining a flange,

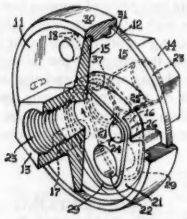
axially extending ribs in said female member extending from said second end to the bottom of said counterbore,

the said bottom of said counterbore defining a shoulder,
a ring L-shaped in cross section having one leg of said L-shape inserted in said counterbore and terminating in spaced relation to the shoulder defined by said bottom of said counterbore defining a groove,
a resilient O-ring in said groove defined by said counterbore and said ring,
an external groove in said male member,
said resilient O-ring being adapted to extend into said groove in said male member when said male member is holding said members together,
a cup-shaped check valve in said female member,



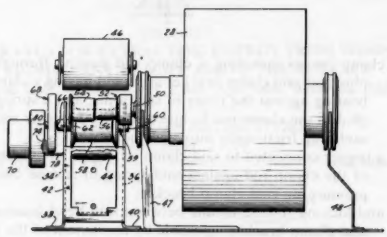
a spring having one end received in said cup-shaped check valve, the other end of said spring engaging the said second end of said female member urging said check valve into engagement with said resilient O-ring,
said check valve terminating in an end surface opposite said cup-shaped side,
a radial groove in said end of said check valve opposite said cup-shaped side,
and an end of said male member being adapted to engage said check valve over said groove,
said check valve defining a passage for fluid flow through said coupling from said second end of said female member between said check valve and said ribs through said radial groove and through a bore in said male member.

3,924,832
IN-LINE CONTROL VALVE
Donald Babcock, 5532 W. 103rd Place, Oak Lawn, Ill. 60453
Filed Sept. 27, 1974, Ser. No. 509,800
Int. Cl.[2] F16K *3/04*
U.S. Cl. 251—301 **8 Claims**



1. A valve interpositioned in end-to-end aligned pipe lines, comprising
a. a housing including complementary end plates in spaced facial abutment, with each plate providing an internally threaded connector defining a fluid passage cavity disposed in coaxial alignment,
b. a plurality of spacer means connecting said end plates in spaced facial abutment and for coaxially aligning said fluid passage cavities,
c. a valve plate between said end plates and providing an orifice movable into and out of communication with the fluid passage cavities defined by said connectors,
d. means for pivotally mounting said valve plate upon one of said spacer means between said end plates,
e. sealing means carried by said valve plate and extending in a continuous path so as to completely encircle the fluid passage cavity, the orifice formed in the valve plate, and said pivotal mounting means,
f. actuator means mounted upon the periphery of said end plates and rotatable about an axis parallel to the fluid passage cavities, positioning said valve plate into and out of open and closed position,
g. and means providing connection between said valve plate and said actuator means whereby said valve plate is pivoted in one direction when said actuator is rotated in said one direction.

3,924,833
CAM CONTROLLED VARIABLE SPEED DRIVE FOR CLOTHES DRYER
Melvin H. Korrell, Benton Harbor, and Sandy C. Gay, St. Joseph, both of Mich., assignors to Nibco Inc., Elkhart, Ind.
Filed Sept. 11, 1974, Ser. No. 504,981
Int. Cl.[2] F16H *7/08*
U.S. Cl. 74—242.4 **12 Claims**

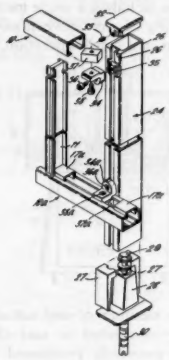


1. In a laundry appliance, a belt shifting device for moving a belt axially on a drive pulley having at least two drive surfaces of different diameters, said device comprising:
a shifter roller;
mounting means for supporting said roller for movement with respect to the belt and in frictional engagement with the belt adjacent to the drive pulley; and
cam means for continuously causing periodic movement of the roller between a first position and a neutral position and between a second position and the neutral position on said mounting means,
said roller in the first position urging the belt from one to another of the drive surfaces of the motor pulley in one direction axially along the pulley, and said roller in the second position urging the belt from one to another of the drive surfaces of the motor pulley in the opposite direction axially along the pulley.

3,924,834
BALUSTRADE UNITS
Charles G. Young, 8 Roberts St., Harbord, New South Wales, Australia
Filed July 25, 1973, Ser. No. 382,615
Claims priority, application Australia, Aug. 8, 1972, 10/72
Int. Cl.[2] E04H *17/14*
U.S. Cl. 256—22 **8 Claims**

1. A balustrade unit comprising a pair of spaced apart channel section members, the open faces of the members being directed towards one another, the free edges of each of the members being turned inwardly to form a pair of opposed longitudinally extending flanges and a pair of longitudinally extending divergent resilient wings provided in the base of the channel section members and formed integrally therewith; a plurality of balusters extending between the channel section

members, each baluster being provided adjacent each end with a pair of transverse shoulder, the balusters each having one cross-sectional dimension adjacent each end smaller than the distance between the opposed longitudinally extending flanges such that the end can be inserted into the space between the flanges of one of the said channel section members



and can then be rotated through a predetermined angle to engage the shoulders of the baluster adjacent the said end with the inner surfaces of said flanges and bring the end face into resilient engagement with said engagement means of the associated channel section member; and a spacing member extending between adjacent balusters, in juxtaposition with at least one of the said channel section members.

3,924,835

MIXER FOR PARTICULATE MATERIALS

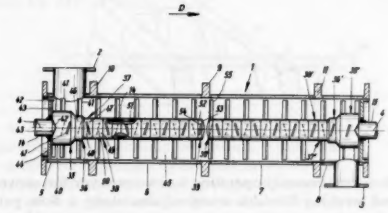
Peter Hohnfeld, Melle, and Hartmut Langenberg, Buer, both of Germany, assignors to Dierks & Soehne, Osnabrueck, Germany

Filed Oct. 26, 1973, Ser. No. 410,248

Claims priority, application Germany, Oct. 28, 1972, 2252996

Int. Cl.² B01F *7/04*

U.S. Cl. 259—6 **8 Claims**



1. A machine for the continuous mixing of particulate materials, comprising:

a substantially horizontally-disposed cylindrical mixer vessel,

a material feed opening and a material discharge opening at opposite ends of said vessel,

a rotatable, horizontal tool carrier axially disposed within said vessel, and

a plurality of mixer paddle tools for rotation in said vessel mounted on said tool carrier, said paddle tools including paddles which extend radially towards and terminate adjacent an inner wall of said vessel,

said tools being detachably mounted on said tool carrier, and

said tool carrier comprising two independent shafts disposed in line with one end of each shaft projecting outwardly from an associated end of said vessel,

two bearing units each rotatably receiving the outwardly-projecting ends of a different one of the tool carrier shafts,

separate rotary drive means coupled to said tool carrier shafts,

said mixer vessel comprises at least two vessel sections which meet at a radial joint plane, adjacent inner ends of said tool shafts being disposed on either side of said joint plane,

a portion of said machine is located to one side of said joint plane, and means for supporting said portion for axial shifting movement relative to the remainder of said machine on the opposite side of said plane to allow access to the interior of said vessel and pivotal movement relative to the remainder of said machine on the opposite side of said plane to allow access to the interior of said vessel, the axis of movement of pivotal portion being disposed parallel to and spaced from the common axis of the aligned tool carrier shafts.

3,924,836

MIXING DEVICE FOR CURABLE LIQUID MATERIAL

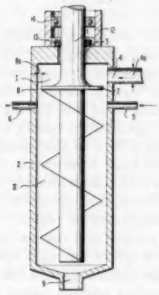
Klaus Bruning, Troisdorf, and Heinrich Lob, Eschmar, both of Germany, assignors to Dynamit Nobel AG, Germany

Continuation of Ser. No. 231,112, March 2, 1972, abandoned. This application Apr. 19, 1974, Ser. No. 462,550

Claims priority, application Germany, Mar. 2, 1971, 2109848

Int. Cl.² B01F *7/24*

U.S. Cl. 259—7 **11 Claims**



1. A device for mixing curable liquid materials which comprises a mixing vessel,

a mixer shaft disposed in said mixing vessel, said shaft being supported for rotation at one end of said vessel,

inlet means for introducing components for forming a curable liquid material mixture into said vessel,

outlet means for discharging the resultant mixture therefrom, said outlet means being disposed at an end of said mixing vessel opposite to said one end,

one of said components of said curable liquid mixture being a liquid component which cannot be cured without additives,

partition means for subdividing said vessel into a first chamber and a second mixing chamber in communication with each other, said partition means including an annularly extending disk mounted on said shaft,

said inlet means including at least one first inlet duct for introducing the liquid component which cannot be cured without additives into said first chamber, said first inlet

duct having a predetermined cross-section, and said inlet means including at least one additional inlet duct for introducing only into said second mixing chamber the additives for curing the liquid component which cannot be cured without additives,

said partition means having an opening from said first chamber into said second chamber, said opening having a cross-section reduced by approximately 0.7 to 0.9 times said predetermined cross-section of said first inlet duct such that said one end of said vessel including said first chamber is maintained free of said curable mixture during mixing of said curable liquid material mixture.

3,924,837

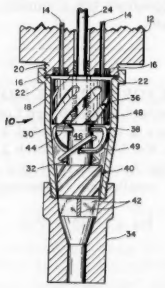
AGITATOR INSERT FOR REACTIVE LIQUID POLYMER MIXER

Stephen A. Knis, Cheshire, and Adnan A. R. Sayigh, North Haven, both of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Dec. 23, 1974, Ser. No. 535,962

Int. Cl.[2] B01F 7/16

U.S. Cl. 259—8 **4 Claims**



1. In apparatus for mixing a plurality of reactive liquid components comprising a mixing head and a nozzle assembly mounted thereon wherein said nozzle assembly comprises an open ended tubular casing having rotary agitator means therein, means in said head for driving said agitator, said agitator including an open ended basket section disposed with its open end adjacent a face of said head, liquid component feed passages in said head terminating in feed ports which open onto the face of said head within the confines of the open end of said basket section, the improvement which comprises: an insert member adapted to be received in the open end of said agitator basket section and rotated therewith, said insert member comprising a spider having a hub and a plurality of legs, each of said legs consisting of a radially extending portion, an axially extending portion joined to the outer end of said radial portion, and a terminal portion secured to the end of the axial portion and extending partially inward in a radial direction, said spider being supported in said basket section of said rotary agitator with said terminal leg portions disposed in close axial spaced relation to said feed ports.

3,924,838

COOKING UTENSIL

Kenji Waniishi, and Koichiro Ninomiya, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 19, 1972, Ser. No. 290,328

Claims priority, application Japan, Sept. 22, 1971, 46-73388

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] B01F 7/16

U.S. Cl. 259—108 **10 Claims**

1. A culinary kitchen utensil comprising:

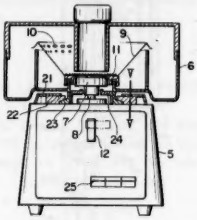
a base member for accommodating a driving means,

removable culinary appliance attachments drivingly connected to said base member,

at least one clamping means for securing said removable attachments to said base member, said clamping means being movable between a clamping position and a releasing position, and

actuating means for moving said clamping means respectively between said clamping and releasing positions,

said actuating means including a single member for moving all of said clamping means between said clamping and releasing positions in a single operation,



wherein said single member of said actuating means is a lever operatively connected to said clamping means, said lever being exteriorly positioned from said base member, and

wherein said actuating means includes a shaft supported in said base member for rotation, a cam fixed to said shaft in said base member for rotation with said shaft, and a pivotable arm operatively connected between said cam and said clamping means such that said pivotable arm is moved by rotation of said cam thereby moving said clamping means, said shaft being rotated by said lever.

3,924,839

CONTINUOUSLY OPERATING SCREW CONVEYOR

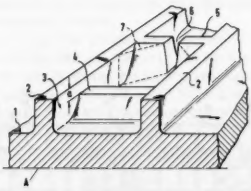
Christian Millauer, Stuttgart, Germany, assignor to Werner & Pfleiderer, Stuttgart, Germany

Filed Oct. 4, 1973, Ser. No. 403,468

Claims priority, application Germany, Nov. 20, 1972, 2256902

Int. Cl.[2] B29B 1/10

U.S. Cl. 259—191 **15 Claims**



1. In a continuously operating screw conveyor for conveying and working flowable compositions along a flow path, comprising housing means, a screw rotatably mounted in said housing and having screw flights thereon defining a screw channel therebetween and transverse shearing webs disposed in said screw channel having a height which is smaller than the height of said screw flights to define a first shearing gap, the improvement comprising at least one transverse splitting web located in said screw channel intermediate the ends of said flow path, said splitting web having a height equal to the height of said screw flights, said splitting web having means defining a second shearing gap therein having at least a radial component relative to the axis of said screw which is different from the radial component of said first shearing gap, said splitting web and said second shearing gap turning a flat lami-

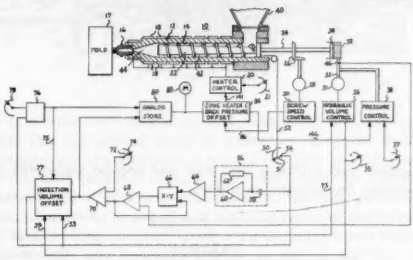
nar flow in said screw channel generated by said first shearing gap by an angle equal to the angular spacing between said first and second shearing gaps, at least one transverse splitting web being disposed between two transverse shearing webs.

3,924,840

VISCOSITY CONTROL FOR A PLASTIC MOLDING MACHINE

Philip H. Nelson, Jr., Roanoke, Va., assignor to General Electric Company, Salem, Va.

Filed Sept. 18, 1972, Ser. No. 289,783
Int. Cl.[2] B29B *1/10*
U.S. Cl. 259—191 **20 Claims**



1. A control for a plastic molding machine of the type in which plastic material is rendered molten through the application of energy by variable means associated with the machine, said control comprising:

a. means to determine the viscosity of the molten plastic material within the machine and to provide an output signal proportional thereto, said means comprising means for determining pressure and velocity parameters associated with said molten plastic material; and,

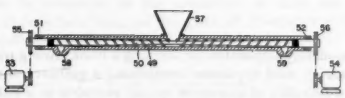
b. control means responsive to said output signal to effect a variation in said variable means whereby the amount of energy applied to said material is changed to thereby change the viscosity of said material.

3,924,841

EXTRUSION MOULDING MACHINE

Jitsumi Shinmoto, 16-4 Koyama 4-chome, Shinaga, Tokyo, Japan

Filed Nov. 30, 1973, Ser. No. 420,700
Claims priority, application Japan, Dec. 7, 1972, 47-122029
Int. Cl.[2] A23C *1/06*
U.S. Cl. 259—191 **7 Claims**



1. An extruder having an input port and an output port for the mixing and extrusion of plastics, comprising:

a housing defining a cylindrical cavity therein;

a tapered feed screw having first and second ends, said feed screw further having a first helical threading on a portion thereof, said tapered feed screw being positioned within said cylindrical cavity with each end being supported by bearings, said first end having a smaller root diameter and located adjacent said input port and said second end having a larger root diameter and located adjacent said output port;

a mixing surface formed on said feed screw adjacent to said first helical threading and positioned adjacent to said output port; and

a threaded sealing surface formed on said feed screw adjacent to said mixing surface near said outlet port such that said mixing surface is located on said feed screw between said first helical threading and said threaded sealing surface, said threaded sealing surface being a second helical threading opposite in inclination to said first helical threading,

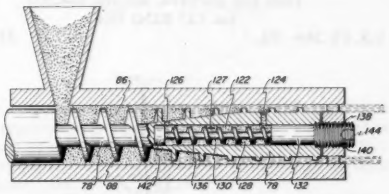
whereby said threaded sealing surface tends to prevent the further progress of said plastic along said housing as said tapered feed screw forces said plastic to be extruded out of said output port adjacent to said mixing surface.

3,924,842

APPARATUS FOR PREPARING A PLASTICATED MATERIAL

Imrich Klein, Highland Park, N.J., and Zehev Tadmor, Haifa, Israel, assignors to Scientific Process & Research, Inc., Highland Park, N.J.

Filed Apr. 11, 1974, Ser. No. 460,046
Int. Cl.[2] B29B *1/06*
U.S. Cl. 259—192 **26 Claims**



1. Apparatus for preparing a plasticated material from solids introduced into the apparatus, said apparatus comprising:

a barrel;

a first screw conveyor in the barrel, said screw conveyor including a flight defining a channel for conveying the material in a downstream direction as the material is melted within the channel, said flight having a leading face facing downstream and a trailing face facing upstream, said channel extending between the leading face and the trailing face;

a passage communicating with the channel at a downstream location and an upstream location and bypassing the channel between said locations, the locations each being positioned such that the downstream location is adjacent the trailing face of the flight to enable unmelted solids to enter the passage at the downstream location, be carried through the passage in an upstream direction, and be reintroduced into the channel at the upstream location; and

a second screw conveyor in said passage arranged to convey material from the downstream location to the upstream location.

3,924,843

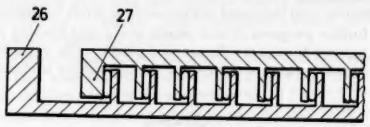
TOOL

Georg Hirmann, Zurich, Switzerland, assignor to Repapress AG, Romanshorn, Switzerland

Filed Mar. 11, 1974, Ser. No. 450,193
Claims priority, application Switzerland, Mar. 9, 1973, 3498/73
Int. Cl.[2] B25B *1/18*
U.S. Cl. 269—20 **10 Claims**

1. Tool comprising a force-producing device having an inflatable member of hose-like shape, a frame member having plurality of mutually spaced transverse walls subdividing the same, said hose-like inflatable member being sinuously disposed in loops within the subdivisions of said frame, and an opposing frame member having an inner space subdivided by a plurality of mutually spaced transverse walls, said transverse walls of said opposing frame member being fitted in said subdivisions defined by said transverse walls of said first-mentioned frame member, said frame members being mutually

superposed with the respective transverse walls thereof alternatingly disposed in the free space of said subdivisions, said inflatable hose-like member being inflatable so as to displace said frame members relative to one another in given direction.

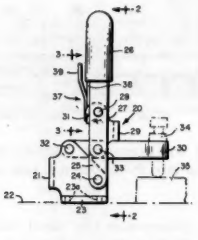


3,924,844

TOGGLE CLAMP LOCK

Hubert C. Bachtel, Jr., Granada Hills, Calif., assignor to Barry Wright Corporation, Watertown, Mass.

Filed July 29, 1974, Ser. No. 488,560
Int. Cl.² B23Q *3/06*
U.S. Cl. 269—94 **23 Claims**



1. A toggle clamp which includes a base, handle means pivotally coupled to the base, link means pivotally coupled to the handle means, workpiece hold-down means pivotally coupled to the base and the link means, and releasable locking means including stop means supported by said link means and movable releasable means for engaging the stop means to prevent relative motion between the handle and the link means when the toggle clamp is in a closed position, said link including camming means for moving said releasable means prior to said releasable means moving off from said camming means and being positioned to engage said stop means as said handle, workpiece hold-down means and link are rotated to place the toggle clamp in a closed position in order to hold said clamp in a closed position.

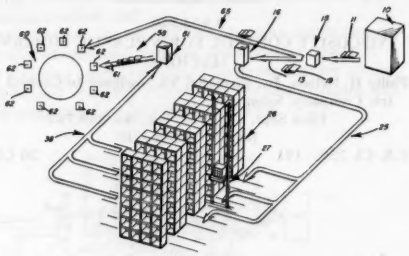
3,924,845

COLLATING METHOD

James C. Wise, and Victoriano Fernandez-Rana, both of Easton, Pa., assignors to Harris-Intertype Corporation, Cleveland, Ohio

Filed Dec. 10, 1973, Ser. No. 423,056
Int. Cl.² B65H *39/02*
U.S. Cl. 270—54 **6 Claims**

1. A method of forming assemblages from at least first and second signatures, said method comprising the steps of printing the first signatures and delivering the first signatures from a printing press in an overlapped shingled stream, placing segments of said shingled stream on a support, releasably clamping the first signatures in a stable overlapped-shingled relationship on said support, transporting and storing remote from the printing press the first signatures while clamped on the support, removing the first signatures from storage while clamped on the support, unclamping and unloading the first signatures from the support, feeding said first signatures in a shingled stream toward a first hopper of a collating machine, printing second signatures, feeding the second signatures toward a second hopper of the collating machine while the first signatures are fed toward the first hopper of the collating machine, and collating said first and second signatures by operating the collating machine.

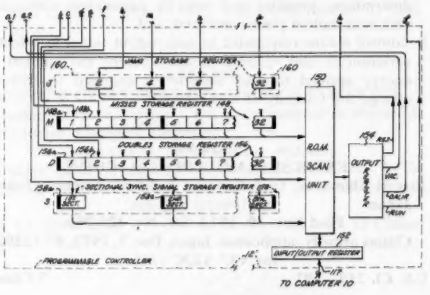


3,924,846

COLLATING METHOD AND APPARATUS

David A. Reed, Easton, Pa., assignor to Harris-Intertype Corporation, Cleveland, Ohio

Filed May 7, 1973, Ser. No. 357,772
Int. Cl.² B65H *43/02*
U.S. Cl. 270—56 **15 Claims**

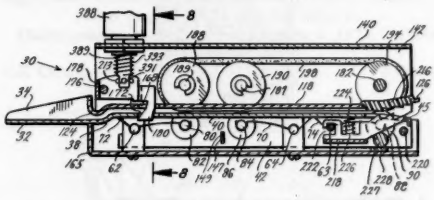


1. A collating apparatus for forming a book from a plurality of signatures, said apparatus comprising a gatherer conveyor having a plurality of conveyor spaces movable in a path successively past a plurality of signature feeding stations and adapted to receive signatures at said feeding stations to form an assembly of different signatures contributing toward a book in each conveyor space, at least one jam detector located on said path of said conveyor spaces for sensing a jam of said assemblies of different signatures as they are moved by said conveyor and for producing a code signal thereupon, means responsive to a code signal from said jam detector to stop said conveyor immediately upon a jam, manually operable means for restarting said conveyor, and reject means along said conveyor path following said plurality of feeding stations for rejecting signature assemblies from said conveyor and controlled by said code signal to reject books from successive conveyor spaces including the conveyor space nearest said jam detector as well as at least one conveyor space upstream from said nearest space and at least one conveyor space downstream from said nearest space when said jam detector produced said reject code signal.

3,924,847
ANTI-RETRIEVAL DEVICE

James R. Pescetto, Hot Springs, Ark., assignor to UMC Industries, Inc., New York, N.Y.

Filed Oct. 11, 1973, Ser. No. 405,538
Int. Cl.[2] B65H 5/00, 5/38
U.S. Cl. 271—3 8 Claims



1. A validator which comprises passageway-defining members that are spaced apart to define an elongated shallow passageway for a document, a pivot, a blocking member which is rotatably mounted on said pivot and which has a portion thereof that is selectively disposable in blocking position in said passageway or out of said blocking position, said portion of said blocking member having a leading edge which inclines downwardly and forwardly relative to said passageway, and wherein any point on said leading edge of said portion of said blocking member which can be engaged by an object inserted into said passageway will be further away from said pivot than is the lower part of said leading edge of said portion of said blocking member, whereby said lower part of said leading edge of said portion of said blocking member will jam against said object if said portion of said blocking member tends to rotate out of blocking position in response to the insertion of said object, whereby said leading edge of said portion of said blocking member can keep said object from rotating said portion of said blocking member out of said blocking position.

3. A validator which comprises a sensor, means to provide relative movement between a document and said sensor, a toothed member past which said means will move an accepted document, a further toothed member past which said means will move said accepted document, both of said toothed members being stationary during the acceptance of each acceptable document, said toothed members being near each other but being out of register with each other, whereby said toothed members can require said document to bow transversely as it moves, and to enable it to move, between said toothed members, said document, after it has been moved past said toothed members, responding to the restorative forces therein to reassume its flat condition, at least one of said toothed members lying in the path of reverse movement of said document after said document has reassumed its flat condition.

3,924,848
PAPER FEED APPARATUS FOR GRIPPER-TYPE PAPER TRANSPORT DEVICE

Shin-Ichi Murakami, Atsugi, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 28, 1974, Ser. No. 437,186
Claims priority, application Japan, June 26, 1973, 48-71253
Int. Cl.[2] B65H 5/08
U.S. Cl. 271—10 6 Claims

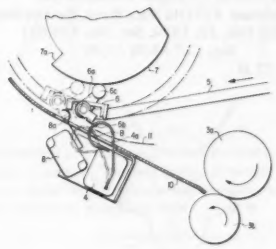
1. A paper feed device for feeding sheets of paper from at least one receptacle therefor, said device comprising:

paper feeding means for feeding sheets of paper from said receptacle at a first rate of speed;

first detecting means responsive to the presence of each of said sheets of paper for rendering said paper feeding means inoperative and stopping each said sheet of paper in a substantially flat condition at a predetermined paper standby position;

chain delivery means having a gripper for clamping each sheet of paper, the locus of said chain delivery means being adjacent to said paper standby position, and the linear speed of said gripper being less than that speed at which said paper sheets are fed;

means for opening said gripper when it is adjacent said paper standby position;



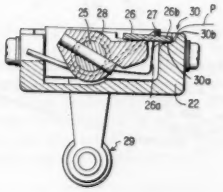
second detecting means for restarting said paper feed means in response to an opened condition of the gripper when the gripper is adjacent the paper standby position to feed each paper sheet from its standby position into the open gripper; and

means for closing said gripper after each paper sheet has been fed into the open gripper so that the paper sheets may be removed from said standby position and transferred by said chain delivery means.

3,924,849
PAPER GRIPPING DEVICE FOR USE WITH A CHAIN DRIVEN PAPER CARRIAGE

Shinichi Murakami, Atsugi, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Apr. 11, 1974, Ser. No. 460,103
Claims priority, application Japan, Apr. 26, 1973, 48-49277
Int. Cl.[2] B65H 29/04
U.S. Cl. 271—277 3 Claims



1. Paper gripping device for use with a chain driven paper carriage having at least two driving chains comprising

a gripper bar mounted between the driving chains of the paper carriage, said gripper bar having a U-shaped configuration where one leg of the U-shaped bar is stepped at the upper extremity thereof to form an inner, lower step and an outer, higher step having a rise therebetween; a shaft rotatably mounted in and along the length of said gripper bar; grip members mounted on said shaft;

springs for respectively biasing said grip members against said inner, lower step of the stepped portion of the gripping bar, said grip members engaging said lower step substantially adjacent to the said rise from said inner, lower step to said outer, higher step so that when a paper sheet is gripped by said gripping member an outwardly convex configuration is imparted thereto by the upper

step of said stepped portion to thereby facilitate subsequent processing of said paper; and

cam means for rotating said grip members away from said lower step against the biasing action of said springs to permit reception or release of said paper away from said paper gripping device.

3,924,850

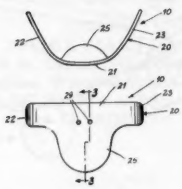
LABIAL MUSCLE EXERCISER

Thomas J. Robertson, 637 Old State Road, Pevely, Mo. 63070

Filed Feb. 22, 1974, Ser. No. 444,831

Int. Cl.[2] A63B *23/00*

U.S. Cl. 272—57 H **9 Claims**



1. A labial muscle exerciser comprising a band contoured to fit in the mouth along the maxillary arch between the upper lip and upper teeth, and a portion extending generally downwardly from the band, the generally downwardly extending portion having an upper portion and a lower portion extending at least somewhat rearwardly from the upper portion, said generally downwardly extending portion being formed to rest against the mentalis muscle with the exerciser in place without force applied forwardly against the action of the labial muscle of the upper lip.

3,924,851

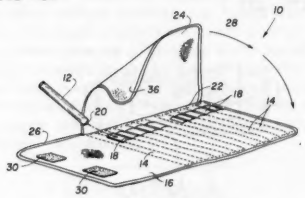
WRIST EXERCISE DEVICE

Herbert Winston, 135 Hazelwood Drive, Jericho, N.Y. 11753

Filed Oct. 25, 1974, Ser. No. 518,043

Int. Cl.[2] A63B *21/18, 23/00*

U.S. Cl. 272—67 **1 Claim**



1. An exercise device adapted to be worn around the user's wrist comprising a fabric body of a rectangular shape having a lengthwise extent so as to be worn in a wrist-encircling position about the user's wrist, an arrangement of plural side-by-side compartments each having an opening thereinto located adjacent an edge of said fabric body, a selected number of said compartments being used for cooperating weights placed therein preparatory to exercising service of said device, and a weights-covering flap having a resilient plastic foam body secured along said fabric body edge adjacent said compartment openings having an operative position folded over said openings against said fabric body and occupying an interposed position between said exercise device and said user's wrist, whereby said operative folded position of said flap obviates inadvertent movement of said weights from said compartment during use of said exercise device while said resilient foam body thereof contributes to comfort during the wearing of said device.

3,924,852

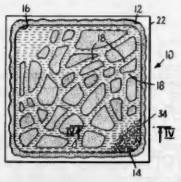
EDUCATIONAL GAME DEVICE

Ronald A. Tamol, 6710 Buckhill Road, Richmond, Va. 23225

Filed Apr. 30, 1975, Ser. No. 572,950

Int. Cl.[2] A63B *9/06;* **A63H** *33/26*

U.S. Cl. 273—1 M **18 Claims**



1. An educational game device comprising

a relatively broad surfaced substantially flat base member, means defining a pair of reservoirs in one face of said base member, each reservoir being disposed at a location remote from the other, there further being means in said one face defining a flow transport course communication between said reservoirs,

a cover member generally coextensive with said base member and received in contact with said one face of said base member, and

a magnetically displaceable colloidal suspension present within said device and normally disposed in one of said reservoirs,

said magnetically displaceable colloidal suspension being selectively transportable from said one reservoir to the other along said flow transport course under the influence of a directional magnetic force.

3,924,853

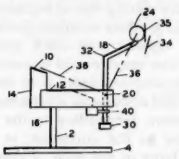
TENNIS PRACTICE DEVICE

Harold F. Schleeger, 1015 Koeps Road, Lancaster, Pa. 17603

Filed Sept. 19, 1974, Ser. No. 507,292

Int. Cl.[2] A63B *61/00*

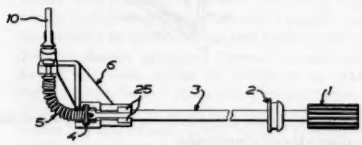
U.S. Cl. 273—29 A **8 Claims**



1. A tennis practice device comprising an upright support means, means positioning said upright support means relative a fixed surface, a rebound surface means being positioned on the upper end of the upright support means, one end of an arm means being affixed to the upright support means, a mounting rod means being pivotally affixed adjacent one of its ends by a pivot pin to the opposite end of the arm means, a ball being positioned on the opposite end of said mounting rod means, a straight line distance from the pivot pin to the ball being substantially equal to the distance from the pivot pin to the rebound surface means, releasable means grasping the mounting rod in the vicinity of said pivot pin to hold the mounting rod means in a first position with the ball spaced away from the rebound surface, said mounting rod means being pivotable to move said ball from said first position to a second position where the ball engages the rebound surface, said mounting rod means when moved from said first position to said second position being released by said releasable means, said mounting rod means not being counterbalanced by a spring means

when it moves from said first position to said second position, and said releasable means re-engages said mounting rod means when the mounting rod means rebounds back from its second position to its first position.

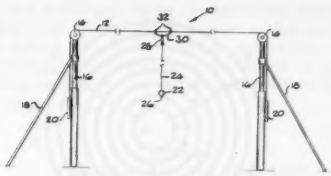
3,924,854
ARRANGEMENT IN TABLE GAMES
Stig Gunnar Hjelmquist, Box 6, 573 01 Tranas 1, Sweden
Filed Aug. 27, 1974, Ser. No. 501,111
Claims priority, application Sweden, Sept. 4, 1973, 7312008
Int. Cl.² A63F *7/06*
U.S. Cl. 273—85 B **5 Claims**



1. A table game of the type intended to imitate hockey, football or like games, comprising a playing area including a board having elongated slots therein and on which a projectile is moved during the game by a number of men mounted for movement by the participants both along said slots and rotated by means of displaceable and rotatable operating assemblies disposed beneath said board, each said operating assembly comprising an elongated rod, an elongated operating pin extending upward through one of said slots and substantially perpendicular to said board for supporting one of said men above said board, an angle shaft coupling connecting the lower end of said pin to one end of said rod for simultaneous rotation therewith, a support member slidably mounted in one of said slots and supporting said pin, said angle shaft coupling, and said one end of said rod for movement therewith, said support member including fixed lower and upper cross pieces cooperating with the lower and upper surfaces, respectively, of said board for mounting said support member in said slots, a first generally vertical guide sleeve journaling said pin for rotation about its axis, and a second generally horizontal guide sleeve engaging and journaling said rod adjacent said one end, said angle coupling being disposed between said first and said second guide sleeves, said second guide sleeve having a slit opening in the side wall thereof extending throughout its length with said opening being of a transverse dimension less than the diameter of said rod adjacent said one end at least throughout a portion of the length of said opening, said second sleeve being formed at least in part from a resilient material whereby said rod may be forced laterally through said opening into said second sleeve, radially extending shoulder means axially fixed on said rod adjacent said one end, and radially extending recess means formed in said second guide sleeve for receiving said shoulder means and cooperating therewith to prevent substantial relative axial movement between said support member and said rod while permitting rotation therebetween.

3,924,855
TETHERED BALL APPARATUS
Hillius Pretorius, Mondeor, Johannesburg, Transvaal, South Africa, assignor to Jet Ball (Eiendoms) Deperk, Johannesburg, South Africa
Filed July 16, 1974, Ser. No. 489,065
Claims priority, application South Africa, July 25, 1973, 73/5082
Int. Cl.² A63B *69/40*
U.S. Cl. 273—95 AA **10 Claims**

1. A ball game apparatus which includes a pair of support members adapted for mounting above ground level; an elongated flexible line having at least one free end and extending essentially horizontally between the support members; a ball slidably suspended from the line intermediate the support members so as to be displaceable along the line by hitting; and a separate weighted element attached to each free end of the



line and adapted to maintain the line resiliently taut between the support members; the line being disposed so that it does not have a slope which favors displacement of the ball in a particular direction along the line.

3,924,856
NON-ROLLING GAME BALL
Howard L. Dekan, 22220-4 James Alan Circle, Chatsworth, Calif. 91311, and John W. Ryan, 674 Nimes Road, Los Angeles, Calif. 90024
Filed Feb. 10, 1975, Ser. No. 548,333
Int. Cl.² A63B *65/00, 71/04*
U.S. Cl. 273—106 R **7 Claims**

1. An article adapted for throwing, or lobbing, against objects comprising a skin covering formed to provide part of a generally spherical shape, a member formed of more rigid material configurated to provide the remainder of the generally spherical shape having securement to the flexible material, the interior of the article being filled with a particulate material whereby the article has the characteristics of unrigid, generally spherical resilient shape.

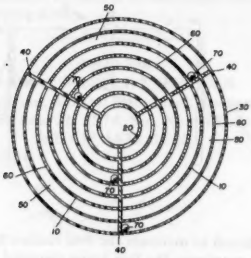
3,924,857
PUZZLE TOY
David E. Christensen, Victoria, Tex., assignor to The Raymond Lee Organization, Inc., a part interest
Filed Apr. 4, 1975, Ser. No. 565,277
Int. Cl.² A63F *7/04*
U.S. Cl. 273—113 **2 Claims**

1. A toy, comprising:

a housing taking the form of a plurality of hollow spherical shells concentrically disposed and connected together by a plurality of radially extending partitions that block off the volume between any two neighboring shells into a plurality of arcuate volumes of like radii of curvature and like radial thickness with each shell that is surrounded by a larger shell bearing a plurality of like circular holes in its surface, whereby neighboring arcuate volumes are connected in sequence to the central spherical volumes

inside the smallest shell; and

a plurality of like spherical balls disposed in the housing, the



diameter of the balls being less than the diameter of the holes.

3,924,858

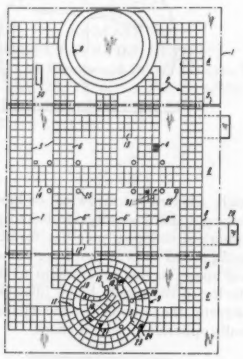
BOARD GAME APPARATUS

Siegfried Dittrich, Bergstr. 28, 896 Kempten, and Kurt Jäckel, Langestr. 38a, 293 Varel, both of Germany

Filed Aug. 23, 1973, Ser. No. 391,154

Int. Cl.[2] A63F 3/00

U.S. Cl. 273—134 AC **9 Claims**



1. In combination as a game in which traffic flow is simulated; a panel having a plurality of playing tracks in the form of a series of spaces of which at least some bear indicia, said play tracks serving as paths along which figures are moved in conformity with values displayed by at least one thrown die, said playing tracks forming both main streets and auxiliary streets and at least the main streets having at least two driving lanes each made up of a series of spaces, said streets including intersecting streets, traffic signal means disposed at intersections of said streets for directing the movement of the figures, at least some of said traffic signal means being instructively variable, and a circular path connected to the ends of said street portions, said auxiliary streets being at least in part inside said circular path and connecting therewith.

3,924,859

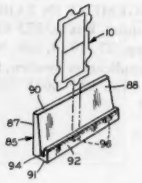
ARITHMETIC FACT GAME

George J. Kramer, 7 High St., Terryville, Conn. 06786

Filed Sept. 27, 1974, Ser. No. 510,075

Int. Cl.[2] A63F 9/20

U.S. Cl. 273—137 C **7 Claims**



1. A game apparatus adapted to be played by a plurality of participating players comprising:

a. a multiplicity of playing pieces assembable relative to each other in a predetermined manner, each of said multiplicity of playing pieces comprising a member having a first pair of sides of equal length extending parallel to each other and a second pair of sides of equal length extending parallel to each other and at right angles to each of said first pair of sides, each of said members having one face thereof divided into two sections, each of said two sections having indicia provided thereon matchable with the indicia appearing on at least one of said two sections of another one of said members, each of said members further including at least one locking means formed on each one of said first pair of sides and of said second pair of sides along the edge thereof, said locking means formed on any one of said first pair of sides and of said second pair of sides of any one of said members being cooperable with said locking means formed on any one of said first pair of sides and of said second pair of sides of any other one of said members for interlocking together any two of said members to maintain said any two of said members in assembled relation in any selected one of a plurality of positions relative to each other, said locking means each comprising a concave-shaped aperture and convex-shaped projection formed in adjoining relation to each other on each of said first pair of sides and on each of said second pair of sides of each of said members, each of said concave-shaped apertures and each of said convex-shaped projections having the same radius of curvature so that said convex-shaped projections formed on any one of said first and second pairs of sides of any one of said members is receivable within said concave-shaped aperture formed on any one of said first and second pairs of sides of any other one of said members, said concave-shaped aperture formed on one of said first pair of sides of each of said members being positioned along the length of said one of said first pair of sides so as to be aligned with said convex-shaped projection formed on the other one of said first pair of sides of the corresponding one of said members and said concave-shaped aperture formed on one of said second pair of sides of said corresponding one of said members being positioned along the length of said one of said second pair of sides so as to be aligned with said convex-shaped projection formed on the other one of said second pair of sides of said corresponding one of said members, and said convex-shaped projection formed on said one of said first pair of sides of said corresponding one of said members being positioned along the length of said one of said first pair of sides so as to be aligned with said concave-shaped aperture formed on said other one of said first pair of sides of said corresponding one of said members and said convex-shaped projection formed on said one of said second pair of sides of said corresponding one of said members being posi-

tioned along the length of said one of said second pair of sides so as to be aligned with said concave-shaped aperture formed on said other one of said second pair of sides of said corresponding one of said members; and

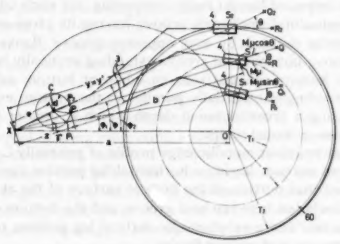
b. a holder comprising an upstanding support having one vertical surface thereof inclined at a slight angle from the vertical for supporting thereagainst a plurality of said multiplicity of playing pieces in an upstanding position, said holder including means formed thereon cooperable with said locking means formed on any one of said first and second pairs of sides of any one of said multiplicity of playing pieces for maintaining said plurality of said multiplicity of playing pieces in supported relation on said holder, said maintaining means comprising a plurality of concave-shaped apertures formed in equally spaced relation relative to each other on said holder, said plurality of concave-shaped apertures formed on said holder each having the same radius of curvature as said convex-shaped projection of said locking means formed on each of said members so as to be capable of receiving therewithin any one of said convex-shaped projections formed on any one of said members.

3,924,860

PICK-UP ARM ASSEMBLY

Etsuro Saito, Atsugi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 5, 1974, Ser. No. 439,828
Claims priority, application Japan, Feb. 17, 1973, 48-19627
Int. Cl.² G11B 3/10
U.S. Cl. 274—1 L **8 Claims**



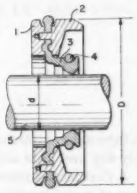
5. A pick-up arm assembly for controlling the reproduction of signals by a stylus from a pre-recorded record disc, the record disc having an initial recorded portion and a terminal recorded portion, comprising: a pick-up arm; a pivotable arm support member for pivotably supporting said pick-up arm at a single pivot point to enable said pick-up arm to scan across the surface of said record disc; means for rotating said pivot point about an axis; a stylus holding member mounted on said pick-up arm for holding said stylus; detecting means for detecting deviations in the position of said pick-up arm with said stylus holding member mounted thereon from a predetermined position during signal reproduction; position adjust means including motor means to drive said pivot point rotating means for adjusting the position of said pick-up arm during signal reproduction to cancel said deviations; and means for limiting the scanning range of said pick-up arm to a confined portion substantially less than the entire surface of said record disc, including: a lead-in memory member for selectively establishing a lead-in position on said record disc for said stylus, said lead-in position being intermediate said initial and terminal recorded portions of said record disc; said lead-in memory member comprising a first rotatable member having a first abutment thereon; a lead-out memory member for selectively establishing a lead-out position on said record disc for said stylus, said lead-out position being intermediate said lead-in position and said terminal recorded portion of said record disc; said lead-out memory member comprising a second rotatable member having a second abutment thereon; stopper means mechanically connected to and rotatable with said pivot point rotating means, said first and second abutments defining an arcuate path for movement of said stopper means to correspondingly limit the movement of said pick-up arm; first restraining means for selectively restraining the rotation of said first rotatable member so that said first abutment defines said leadin position; and second restraining means for selectively restraining the rotation of said second rotatable member so that said second abutment defines said lead-out postion.

3,924,861

RADIAL SHAFT PACKING RING

Jenö Szepesvary, Brockesstr. 3, 8 Munich 83, Germany

Filed Mar. 13, 1974, Ser. No. 450,729
Claims priority, application Germany, Mar. 13, 1973, 2312548
Int. Cl.² F16J 15/32
U.S. Cl. 277—185 **7 Claims**



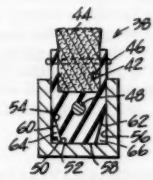
1. A radial packing ring for a shaft comprising a sealing element, said sealing element having a bulbous peripheral edge engageable with a bore into which the packing ring is inserted and an inner peripheral lip engageable with a shaft passing through the bore so that the packing ring is sealed simultaneously with respect to a bore into which it is inserted and with respect to a shaft passing through the bore, and first and second rings clamping said sealing element therebetween and connected together.

3,924,862

SEALING DEVICE AND METHOD OF FABRICATION THEREOF

Stanley M. Houston, 74 Scenic Drive, Orinda, Calif. 94563

Filed Mar. 26, 1973, Ser. No. 345,195
Int. Cl.² F16J 15/24
U.S. Cl. 277—231 **13 Claims**



1. A sealing device for providing sealing relation between itself and a surface of a member comprising:

an elongated resilient elastomeric carrier which may be disposed about a portion of the member; and

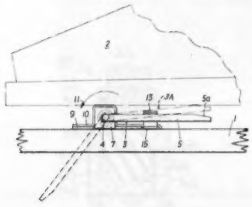
an elongated felt member fixed to and along the carrier and which may contact the surface of the member with the carrier so disposed;

wherein the carrier defines a base, and a pair of carrier sides tapered inwardly of each other in the direction of the base.

3,924,863
GASKET
Soichi Nakano, and Yoshitoku Iizuka, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 10, 1974, Ser. No. 531,311
Claims priority, application Japan, Dec. 11, 1973, 48-137359
Int. Cl.² F16J 15/12
U.S. Cl. 277—235 B 10 Claims

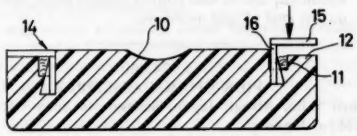
1. A gasket for an internal combustion piston engine having confronting relatively hot and cold contact surfaces comprising, in combination: A first plate formed of insulated material, a second plate formed of metal having a relatively high coefficient of thermal expansion, a third plate formed of metal having a relatively low coefficient of thermal expansion, said first plate being positioned between said second and third plates, said second plate being adapted to contact the relatively cold contact surface of the engine and said third plate being adapted to contact the relatively hot contact surface of the engine.

3,924,864
BRAKING MECHANISM FOR SKIS
Erwin Weigl, Brunn am Gebirge, Austria, assignor to Gertsch AG, Zug, Switzerland
Filed July 2, 1974, Ser. No. 485,247
Claims priority, application Austria, July 6, 1973, 5994/73
Int. Cl.² A63C 7/10
U.S. Cl. 280—11.13 B 10 Claims



1. A braking mechanism for a ski provided with a releasable binding comprising a lever pivotally mounted on the upper surface of the ski in the vicinity of the binding and adapted to be held against movement when a boot is held in the binding and to be pivoted downwardly into engagement with the surface supporting the ski when the boot is released to prevent further travel of the ski, said lever comprising a two-arm bar having one arm which extends substantially parallel to the longitudinal axis of said ski and a transverse arm which extends transversely to said longitudinal axis of said ski, said transverse arm having a twisted polygonal cross section, a guide for holding said twisted polygonal cross section of said transverse arm and having an opening therethrough corresponding in cross section to the cross section of said polygonal cross section so that an outward movement of said transverse arm through said opening will effect a pivoting movement of said two-arm bar and resilient means for urging said two-arm bar outwardly from an at rest position and pivoted into a braking position.

3,924,865
STEEL EDGE
Wolfgang Benner, Landsiedlerstrasse, 7184 Kirchberg (Jagst), Germany
Filed Dec. 4, 1972, Ser. No. 312,129
Claims priority, application Germany, Dec. 3, 1971, 2159993
Int. Cl.² A63C 5/04
U.S. Cl. 280—11.13 N 9 Claims



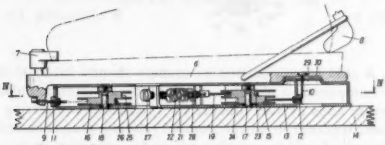
1. In a ski having a body fabricated of wearable, flexible material, a wearing edge construction on at least the two bottom edges of the ski body comprising, for each edge:
a longitudinal anchoring groove having its cross-sectional profile defined by two opposing groove flanks and a groove bottom, said groove extending vertically from the ski bottom spaced from an adjacent bottom edge and extending substantially parallel to the bottom edge and having a cross-sectional depth which is greater than its cross-sectional width;
a wear resistant metallic edge profile of generally L-shaped cross section, having a horizontal leg portion covering at least that portion of the bottom surface of the ski which is included between said groove and the bottom edge of the ski, and a substantially vertical leg portion received between said groove flanks;
a succession of longitudinally spaced cuts in the vertical leg portion of the edge profile, the cuts extending from the top edge thereof over a major portion of the height of the leg portion, whereby the vertical leg portion is subdivided into successive tongue-shaped vertical extensions;
a gap associated with each of said cuts permitting the tongue-shaped extensions to longitudinally approach one another under deflection of the ski body tending to longitudinally bow said edge profile; and
bonding means arranged in said groove for retaining the vertical leg portion of the edge profile within the groove flanks, said bonding means having resilience sufficient to retain said vertical extensions in said groove while permitting longitudinal movement of said extensions within said groove.

3,924,866
SKI BINDING
Gottfried Schweizer, Vienna, Austria, assignor to Gertsch AG, Zug, Switzerland
Filed June 3, 1974, Ser. No. 475,755
Claims priority, application Austria, June 15, 1973, 5301/73
Int. Cl.² A63C 9/08
U.S. Cl. 280—11.35 N 11 Claims

1. A ski binding arrangement for holding a ski boot onto a ski, comprising:

a mounting plate having fastening means thereon for fastening said ski boot to said mounting plate;

threshold releasing securement means for securing said mounting plate to said ski, said threshold releasing securement means including force transmitting means mounted on one of said mounting plate and said ski and pivotal about a fixed pivot axis, elongated cable means secured at one end to said force transmitting means and engaging said force transmitting means at a first location thereon and at the other end to the other of said ski and said mounting plate and resilient means connected at one end to said force transmitting means and applying a force thereto at a second location thereon and anchored at the other end to said one of said mounting plate and said ski, said resilient means effecting a tensioning of said cable means through said force transmitting means to define a holding force when said mounting plate is mounted on said ski and the longitudinal axis of said mounting plate is parallel to said longitudinal axis of said ski;



a first normal spacing between a longitudinal axis of said cable means adjacent and extending away from said force transmitting means and intersecting said first location and said pivot axis being less than a second normal spacing between a longitudinal axis of said resilient means adjacent and extending away from said force transmitting means and intersecting said second location and said pivot axis while said mounting plate is mounted on said ski and the longitudinal axis of said mounting plate is parallel to said longitudinal axis of said ski, said first normal spacing increasing and said second normal spacing decreasing and said resilient means becoming more tensioned and said cable means becoming less tensioned in response to an increasing movement of any part of said mounting plate away from said ski, an initial movement of said mounting plate being resisted by said holding force and upon an exceeding of said holding force, a release of said mounting plate from engagement with said ski will be effected.

3,924,867

SPRING LOCKING DEVICE

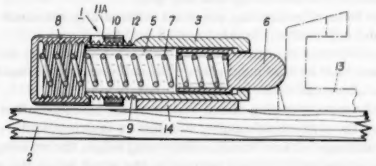
Josef Koos, Vienna, Austria, assignor to Gertsch AG, Zug, Switzerland

Filed Aug. 14, 1974, Ser. No. 497,219

Claims priority, application Austria, Aug. 30, 1973, 7517/73

Int. Cl.² A63C 9/08

U.S. Cl. 280—11.35 T **3 Claims**



1. In a safety ski binding, a spring locking device having an elongated hollow housing with a body part thereon, said body part having a threaded portion at one end thereof, a crown nut rotatably secured on said threaded portion, a locking element at the end of said hollow housing remote from said crown nut and a spring engaging and extending between said crown nut and said locking element to urge said locking element into engagement with a counterlocking part, a rotation of said crown nut on said threaded portion effecting a change in the spring force acting on said locking element, the improvement comprising means defining at least one elongated groove in said body part, the longitudinal axis of which is parallel to the axis of said body part, said groove having indicia therein and indicator means on said crown nut for cooperating with said indicia to indicate the extent to which said spring force is adjusted.

3,924,868

SKI BINDING HAVING AN ADJUSTABLE HEEL HOLDER

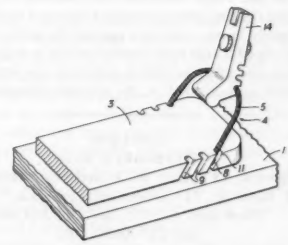
Josef Koos, Vienna, Austria, assignor to Gertsch AG, Zug, Switzerland

Filed July 22, 1974, Ser. No. 491,108

Claims priority, application Austria, July 20, 1973, 6452/73

Int. Cl.² A63C 9/086

U.S. Cl. 280—11.35 K **6 Claims**



1. A safety ski binding for ski boots, comprising:

a plate separate from said ski and adapted to have a sole of a ski boot mounted on an upper surface thereof;

holding means connected to said plate for holding a heel portion of said ski boot onto said upper surface of said plate, said holding means comprising (1) a control cable having enlargements on the opposite free ends thereof, (2) at least a pair of recesses in said plate, said recesses sized to receive said control cable therein, retain said enlargements therein, and prevent passage of said enlargements therethrough so that said control cable extends between said pair of recesses in vertically spaced relation to said upper surface of said ski, (3) a holding member mounted on said control cable for engaging and holding said heel portion of said ski boot onto said upper surface of said plate and (4) a spring located between said enlargements, engaging said holding member and encircling said control cable, the ends of said spring adjacent said enlargements engaging said upper surface to urge said enlargements into said recesses.

3,924,869

SKI SAFETY BINDING

Rolf Strub, Av. Gennecy 3, 1249 Avully, Geneva, Switzerland

Filed Nov. 5, 1974, Ser. No. 521,168

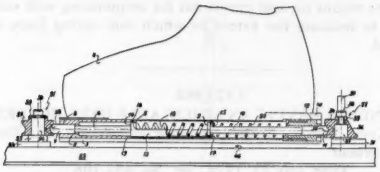
Claims priority, application Switzerland, Nov. 21, 1973, 16404/73; Oct. 10, 1974, 13620/74

Int. Cl.² A63C 9/086

U.S. Cl. 280—11.35 D **21 Claims**

1. Safety ski binding, characterized by the fact that it comprises on the one hand two anchoring supports intended to be fastened to the ski opposite each other and each having a retaining surface of convex shape in a horizontal plane, and on the other hand two catch elements intended to be attached longitudinally to the ski boot, one alongside the other, by the

fact that each of these catch elements comprises an elongate channel two opposite push members movable axially within said channel and intended to extend from said channel, one to come into engagement with the retaining surface of one of the anchoring supports and the other with the retaining surface of the other anchoring support so that the push members corresponding to each of the anchoring supports are arranged symmetrically with respect to the convexity of the retaining surface of the said anchoring support, by the fact that the push



members of each of said catch elements each bear a piston which is movable within said channel against the action of a first spring arranged between said pistons, and by the fact that in each of the catch elements the assembly formed by the pistons and the first spring arranged between them is movable longitudinally in one direction against the action of a second spring arranged within said channel, which is weaker than said first spring, and said assembly is subject to the action of a stop, fixed within said channel, in the opposite direction.

3,924,870

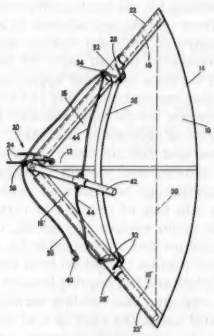
HAND-HELD SAIL

Mayer Spivack, 53 Spruce St., Watertown, Mass. 02172, and Fred R. Kern, Jr., 12 Cooke Road, Lexington, Mass. 02173

Filed Sept. 4, 1973, Ser. No. 393,989

Int. Cl.[2] A63C *3/00*

U.S. Cl. 280—11.37 S **27 Claims**



1. A hand-held aerodynamic propulsion device comprising: a sail adapted to define an airfoil configuration;

frame means for supporting said sail, said frame means including first grippable means on one side of said sail and aft of the forward region of said sail for gripping the device; and

second grippable means connected to the device forwardly of said first grippable means and on said one side of said sail, said second grippable means having a portion thereof disposed aft of the forward region of said sail and to the same side of said sail as said first grippable means to enable said device to be held away from the user's body, at least one of said grippable means extending in a direction which is away from said sail and to an extent sufficient to provide substantial leverage in controlling the attitude of said sail.

3,924,871

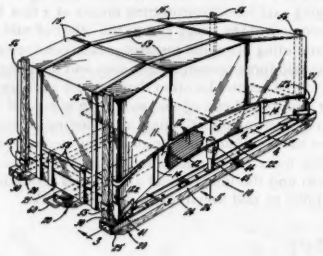
SKID FOR TRANSPORTING SHEET MATERIAL

Miles H. Mesenbring, R.R. 2, Bourbonnais, Ill. 60914

Filed Jan. 13, 1975, Ser. No. 540,573

Int. Cl.[2] B62B *15/00*

U.S. Cl. 280—12 R **14 Claims**



1. A skid for supporting an arcuate shaped load for transport comprising a plurality of longitudinal runners, means at opposite ends of said runners for releasably connecting said runners together in spaced parallel relation, means associated with each of said connecting means for engaging an end of a load supported on said skid, and an arcuate shaped support removably mounted at the center of said runners for supporting a curved underside of said load.

3,924,872

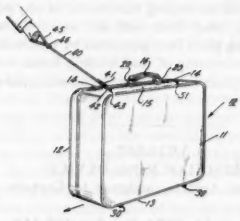
LUGGAGE WITH PULL DEVICE

Pasquale Robert Sollazzi, Newark, Del., and Michael Avrum Kaufman, Melville, N.Y., assignors to Rapid-American Corporation, New York, N.Y.

Filed Aug. 8, 1974, Ser. No. 495,647

Int. Cl.[2] B62B *11/00*

U.S. Cl. 280—47.37 **3 Claims**



1. In luggage having a bottom wall and a top wall; a flexible pull strap; means for permanently securing one end of said pull strap on said top wall; and means for releasably securing the other end of said pull strap on said top wall, the pull strap, when thus releasably secured, extending in substantial surface to surface relation along said top wall;

said bottom wall being provided with rolling members and the top wall is provided with a handle;

the said strap being permanently secured to said top wall on one side of said handle and releasably secured to said top wall on the other side of said handle;

said strap extending along said handle when said other end of the strap is releasably secured to said top wall;

mountings for said handle comprising loops, the openings of said loops extending normal to the strap when the strap is releasably secured at its said other end; the strap, when so secured, passing through said loops;

the strap being looped at its secured end and having a hand loop at its other end; a releasable attachment member on

one surface of said hand loop and a corresponding releasable attachment member on the said top wall on the side of the handle opposite the point of securement of the strap; the said strap presenting a balanced appearance at the luggage top.

3,924,873

REAR WHEEL SUSPENSION FOR A VEHICLE HAVING A BEAM AXLE

Stephen John Crouch, 7 Highwayman's Croft, Coventry, Warwickshire, England, assignor to The Rover Company Limited, Coventry, England

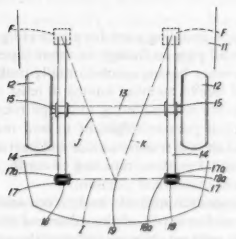
Filed July 18, 1973, Ser. No. 380,338

Claims priority, application United Kingdom, Aug. 23, 1972, 39342/72

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] B60G *11/42*

U.S. Cl. 280—124 R **4 Claims**



1. In a rear wheel suspension for a vehicle having a beam axle which supports the vehicle structure through two leaf spring assemblies, disposed perpendicular to and near opposite ends of the axle; the rear end of each assembly being coupled to the vehicle structure by rear resilient means having greater resistance to displacement of the rear end of the assembly relative to the structure in a direction parallel to the ground plane and parallel to the axle than to displacement of the rear end in a direction parallel to the ground plane and at right angles to the axle; the improvement comprising:

first front resilient means coupling the front end of one assembly to the vehicle structure and second front resilient means coupling the front end of the other assembly to said structure, said first front resilient means providing greater resistance displacement of the front end of said one assembly relative to the structure in the direction of a first line extending from said first front resilient means to a point behind said axle midway between said rear resilient means than to the displacement of the front end of the assembly in a direction parallel to the ground plane and at right angles to said line, while said second front resilient means provides a greater resistance to the displacement of the front end of the other of said assemblies relative to the structure in the direction of a second line extending from said second front resilient means to said point than to the displacement of the front end of said other assembly in a direction parallel to the ground plane and at right angles to said line.

3,924,874

PROTECTION DEVICE FOR VEHICLE PASSENGERS

Bela Barenyi, Maichingen, and Hermann Renner, Magstadt, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

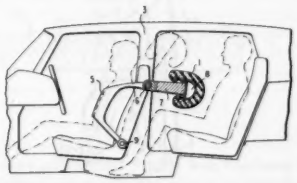
Filed June 2, 1972, Ser. No. 259,236

Claims priority, application Germany, June 4, 1971, 2127688

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] B60R *21/10*

U.S. Cl. 280—150 B **11 Claims**



1. In a protection device for front and rear seat vehicle passengers, said device being of the type having an impact means pivotally mounted by at least one pivotal connecting means from at least the vehicle center columns approximately in proximity to front seat backrests of the vehicle so that the impact means are selectively provided in a substantially horizontal use position for the protection of rear seat passengers and in a substantially upright rest position, and said device having safety belt means for protecting front seat passengers, wherein the improvement comprises said at least one pivotal connecting means simultaneously including at least one upper fastening means for said safety belt means.

6. In a protection device for front and rear seat vehicle passengers, said device having an impact means pivotally mounted by pivotal connecting means from each vehicle center column approximately in proximity to front seat backrests of the vehicle so that the impact means are selectively provided in a substantially horizontal use position for the protection of rear seat passengers and in a substantially upright rest position, and said vehicle having safety belt means for protecting front seat passengers, wherein the improvement comprises said pivotal connecting means simultaneously including an upper fastening means for said safety belt means, and

wherein each of said safety belt means are four-point safety belt means, and further wherein an auxiliary bearer means secured to the impact means extends within the area between the backrests of the front seats essentially in the vehicle longitudinal direction, said upper fastening means for each four-point safety belt means including an upper central supporting point being arranged at the auxiliary bearer means and an upper outer fastening point at the pivotal connecting means, said upper central supporting point and said upper outer fastening point of each four-point safety belt means being approximately aligned.

3,924,875

SLIDING FITMENT FOR SAFETY BELT

Andre Lefeuvre, Noisy-le-Roi, France, assignor to Regie Nationale des Usines Renault, Billancourt and Automobiles Peugeot, Paris, both of, France

Filed Jan. 11, 1974, Ser. No. 432,619

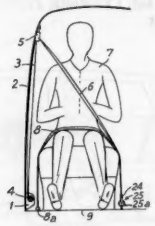
Claims priority, application France, Feb. 15, 1973, 73.05415

Int. Cl.[2] B60R *21/10*

U.S. Cl. 280—150 SB **6 Claims**

1. In a vehicle having a safety belt system which includes a strap extending between anchorages on the vehicle body and tensioned between said anchorages: a fitment constructed for

slidably receiving said strap, said fitment comprising a body, aperture means on said body for allowing admission of said belt into said body, brake shoe means disposed to clamp said strap with respect to said body, support means comprising a pair of link means connected to said body and to said brake shoe means for supporting said brake shoe means for movement between a first position in which said strap is clamped and a second position in which said strap is released, and driving means for driving said brake shoe means into said first



position, said driving means including first and second brake actuating means including a cross-tie disposed to engage said strap, means connecting one end of each of said link means to said cross-tie, frame means integral with said fitment body, elongate openings in said frame means disposed to slidably receive said cross-tie, and attachment means connected to the other end of each of said link means, further elongate openings in said fitment body disposed to slidably receive said attachment means, and means pivotally connecting said attachment means to said brake shoe means.

3,924,876

APPARATUS FOR INSTALLING A HEAVY MOBILE MACHINE IN A WORKING POSITION

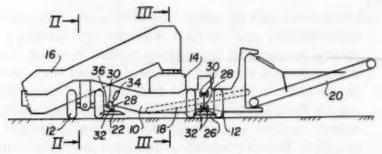
Christian Vaillant, Douchy les Mines, and Jean Pierre Menissez, Wavrechain sous Denain, both of France, assignors to Fives-Cail Babcock, Paris, France

Filed Nov. 15, 1973, Ser. No. 416,198

Claims priority, application France, Nov. 17, 1972, 72.40860

Int. Cl.[2] B60S 9/10

U.S. Cl. 280—150.5 **4 Claims**



1. In a mobile crusher unit or like machine which comprises a chassis, wheels with pneumatic tires supporting the chassis on the ground for displacement of the chassis to a working site, and retractable support feet supporting the chassis on the ground at the working site in a working position:

1. means for mechanically locking the feet in a lowered or working position, and

2. a pneumatic circuit including a source of pneumatic fluid connected to all pneumatic tires for simultaneously inflating or deflating all the tires,

a. inflation of the tires by the pneumatic circuit enabling the chassis to be fully supported for displacement the working site and keeping the feet in their lowered position off the ground, and

b. deflation of the tires by the pneumatic circuit permitting the locked feet in the lowered position to contact the ground whereby the chassis is supported on the feet in the working position.

3,924,877

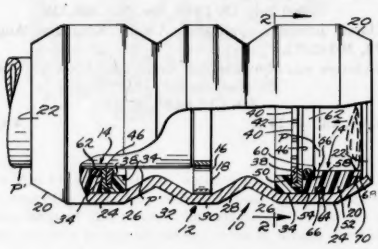
STAB-TYPE COUPLING JOINT

Wilbur R. Leopold, Jr., Decatur, Ill.; Frank C. Hackman, Albertville, Ala.; Lawrence F. Luckenbill, and Daniel A. Ellis, both of Decatur, Ill., assignors to Mueller Co., Decatur, Ill.

Filed Sept. 9, 1974, Ser. No. 504,249

Int. Cl.[2] F16L 21/02

U.S. Cl. 285—340 **23 Claims**



1. A stab-type coupling joint for connecting an end portion of a smooth wall pipe to fittings or other pipes comprising:

a sleeve member having a substantially uniform wall thickness, said sleeve member having at least one frusto-conical end portion terminating in a pipe receiving aperture, a cylindrical portion adjacent to and merging with the larger end of said frusto-conical end portion and a second frusto-conical portion tapering inwardly from the other end of said cylindrical portion;

stop means spaced inwardly away from said pipe receiving aperture and inwardly of the other end of said cylindrical portion to prevent over-insertion of the pipe through said pipe receiving aperture;

said one frusto-conical end portion, said cylindrical portion, and said second frusto-conical portion defining an annular interior space in said sleeve member;

an annular backup insert ring, an annular finger pipe gripper washer having radially inwardly extending gripper fingers, a rigid annular washer, and a second insert ring in series and positioned in said annular interior space and retained between said second frusto-conical portion and said frusto-conical end portion, respectively, said second annular insert ring having an exterior configuration substantially complementary to a portion of said cylindrical portion and said frusto-conical end portion;

and at least one sealing ring carried by said second insert ring on the interior surface of the same for sealing with the exterior of the pipe and at least one sealing ring carried on the exterior of said second insert ring for sealing with the interior of said sleeve member.

3,924,878

PROTECTIVE HOUSING MEANS FOR TRAILER COUPLER HITCHED TO VEHICLE OR DEVICE

Leslie H. Utman, 1441 NW. 19th St. Apt. 231, Miami, Fla. 33142, and Dante M. Fiorini, 23 Prospect Drive, Coral Gables, Fla. 33133

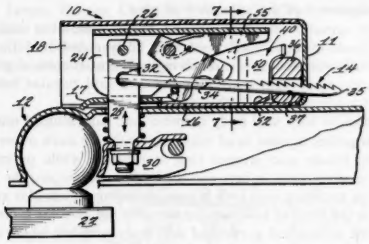
Continuation-in-part of Ser. No. 145,760, May 21, 1971, abandoned. This application June 15, 1972, Ser. No. 263,212

Int. Cl.[2] B60D 1/12

U.S. Cl. 280—507 **10 Claims**

1. Apparatus for use with a coupler for releasably hitching a trailer to a prime mover, said coupler having a member for releasing the trailer from the prime mover, said apparatus comprising

a. a protective housing means for preventing access to the releasing member and preventing movement thereof from a hitched condition when in access-preventing relationship therewith, said means including a housing member having a first open end thereof for allowing sliding movement of said housing member over said releasing member, and



b. means for locking the coupler in its hitched condition by securing said housing means in access-preventing relationship with the releasing member, said means including a first member positively connected to the coupler and a second member for operative connection to said housing means said housing means also being in access-preventing relationship with said first member.

3,924,879

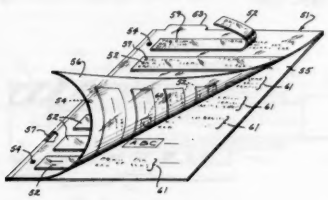
FLEXIBLE FILM TRANSPARENCY DISPLAY MAKERS

John S. Wright, 6115 N. Lake Drive Court, Milwaukee, Wis. 53217

Continuation-in-part of Ser. No. 221,898, Jan. 31, 1972, abandoned, which is a continuation-in-part of Ser. No. 43,086, June 3, 1970, abandoned. This application Mar. 28, 1974, Ser. No. 455,571

Int. Cl.[2] B41L 1/16

U.S. Cl. 282—28 R **1 Claim**



1. A product for making and storing transparency displays comprising the combination of

a carrier sheet of a transparent material having a glossy surface;

a backing sheet of opaque material bound to said carrier along one edge and adjacent a surface of said carrier sheet opposite said glossy surface;

a pluraity of transparency films, having a glossy surface and being trasparent, soft and flexible, and being removably adherent to said glossy surface of said carrier sheet without adhesive, solvent or fusion by pressing said glossy surface of said transparency films against said glossy surface of said carrier sheet, said transparency films being adapted for receiving imprinted images;

and a duplicating medium between said carrier sheet and said backing sheet to transfer to said backing sheet duplications of images imprinted on said transparency films.

3,924,880

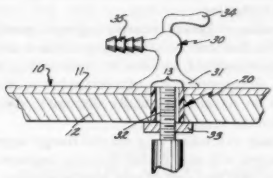
LABORATORY COUNTER TOP AND FITTINGS THEREFOR

Paul J. Betts, Muskegon, Mich., assignor to Inter Dyne, Spring Lake, Mich.

Filed Nov. 5, 1973, Ser. No. 412,670

Int. Cl.[2] F16L 3/00

U.S. Cl. 285—61 **9 Claims**



1. A laboratory counter top for use with hardware fittings having a shoulder and a securing means spaced from the shoulder whereby the fitting can be secured in an aperture through said top with said shoulder on one side of the top and said securing means on the other side of the top, said laboratory counter top comprising: a composite top including a top layer of a material providing a suitable surface for laboratory use and a substrate layer of a less expensive backing material, said top layer being thin relative to the overall thickness of said counter top; an aperture through said composite top; generally cylindrical spacer means in said aperture, said spacer means having peripheral dimensions throughout its entire length approximately equal to those of said aperture and said spacer means extending from the top surface of said top to the bottom surface of said top and having greater rigidity in an axial direction, extending from the top to the bottom of said counter top, than does said counter top between its said top and bottom surfaces, whereby a fitting inserted through said aperture can be tightened down against said spacer means, thereby minimizing compressive forces on said laboratory counter top.

3,924,881

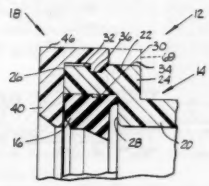
INJECTION MOLDED PLASTIC PIPE FITTING

John Vincent O'Connor, Englewood, Colo., assignor to Johns-Manville Corporation, Denver, Colo.

Filed Jan. 22, 1975, Ser. No. 542,979

Int. Cl.[2] F16L 21/02, 47/00

U.S. Cl. 285—156 **3 Claims**



1. A female member of a pipe joint, comprising:

a. an axially extending hollow section having an external surface, an internal surface and a free end defining an opening into the section to provide entry for the male member of the pipe joint;

b. outwardly directed external shoulder means connected with the external surface of said hollow section, spaced a predetermined distance from said free end and facing away from said free end;

c. inwardly directed internal shoulder means connected with the internal surface of said hollow section, spaced a predetermined distance from and facing said free end;

d. a circumferential sealing gasket disposed concentrically within said hollow section between said free end and said internal shoulder means to provide sealing means for the pipe joint, said gasket having one side thereof adjacent said internal shoulder means and its opposite side facing said free end;

e. an integral, injection molded plastic gasket retaining element including

i. a ring-shaped gasket securing segment positioned adjacent the free end of said hollow section and including a circumferential surface in confronting relationship with said opposite side of said gasket to maintain said gasket in its concentrically disposed position within said hollow section, and

ii. an axially extending ring-shaped flange segment joined at one end with said gasket securing segment at approximately said free end of said hollow section, said flange segment extending over and concentrically around a portion of said hollow section from said free end and extending at least to said external shoulder means;

f. two co-planer internal shoulder means connected with and extending circumferentially along the internal surface of said flange segment, adjacent said external shoulder means connected with the external surface of said hollow section, said co-planer shoulder means being spaced from one another by circumferential portions of said flange segment and facing the free end of said hollow section in confronting engagement with said external shoulder means whereby to prevent free separation between said gasket retaining element and said hollow section; and

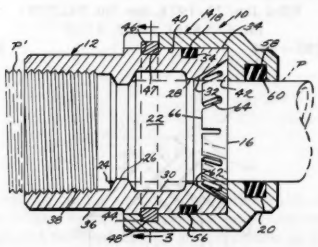
g. reinforcing means comprising an axial extension of at least a portion of said flange segment, said extension extending axially past said two co-planer external shoulder means.

3,924,882

STAB-TYPE COUPLING JOINT

Daniel A. Ellis, Decatur, Ill., assignor to Mueller Co., Decatur, Ill.

Filed Oct. 4, 1974, Ser. No. 512,484
Int. Cl.² F16L *55/00*
U.S. Cl. 285—175 **9 Claims**



1. A stab-type coupling joint for connecting an end portion of a smooth wall pipe to a fitting or another pipe, said coupling joint comprising:

a body member having a passageway therethrough, stop means in said passageway to limit insertion of the smooth wall pipe, a bore defining a portion of said passageway and having a diameter to receive the smooth wall pipe, said bore terminating at its end away from said stop means in an outwardly flaring frusto-conical surface, said body member having a cylindrical exterior configuration on the end portion which receives the smooth wall pipe;

a tubular member having a bore extending from one end thereof with the bore having a diameter sufficient to telescopingly receive the cylindrical end portion of said body member, said last-mentioned bore terminating in an inwardly extending annular shoulder having an inner diameter at least as great as the diameter of the smooth wall pipe;

a frusto-conical gripper ring having spaced slots extending from its smaller end to define gripper fingers, the smaller end of said gripper ring having a diameter less than the diameter of the smooth wall pipe;

said annular shoulder of said tubular member and said frusto-conical surface of said body member defining a frusto-conical space receiving said frusto-conical gripper ring when said body member and said tubular member are telescoped together;

means to lock said body member and said tubular member together against axial movement relative each other so as to retain said gripper ring in position while permitting relative rotation between the body member and the tubular member, said lock means including an annular groove in the bore of said tubular member, an annular groove on the cylindrical portion of said body member which cooperates with the groove of said tubular member to define an annular passage, and a ring-like element positioned entirely within said annular passage for locking the tubular member and the body member against axial movement but permitting their relative rotational movement; and,

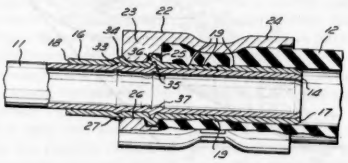
a first sealing means sealingly positioned between the bore of said tubular member and the cylindrical end portion of said body member and a second sealing means between said tubular member and the exterior of the smooth wall pipe, said second sealing means being positioned outwardly of said gripper ring whereby it sealingly engages said tubular member along with said smooth wall pipe on a portion of the same not previously engaged by said gripper ring.

3,924,883

HOSE COUPLING

Irving G. Frank, Euclid, Ohio, assignor to The Weatherhead Company, Cleveland, Ohio

Filed June 12, 1974, Ser. No. 478,582
Int. Cl.² F16L *33/00*
U.S. Cl. 285—256 **7 Claims**



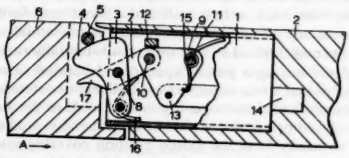
1. A hose coupling comprising a metal tube having an interior and an exterior and a free end, a metal reinforcing sleeve having an interior and an exterior and a free end, a metal collar, and a flexible hose, the reinforcing sleeve being separate from the tube and being disposed on the exterior of the tube, the collar being disposed on the exterior of the reinforcing sleeve, the collar having a body portion closely adjacent the exterior of th reinforcing sleeve and spaced axially from the free ends of the reinforcing sleeve and tube, the collar also having a skirt portion spaced radially outwardly of the exterior of the reinforcing sleeve and extending axially from the body portion toward the free ends of the tube and reinforcing sleeve, the hose being received within the skirt portion over the exterior of the reinforcing sleeve, the tube and reinforcing sleeve each being radially outwardly deflected and providing radially outwardly extending annular beads on at least the side of the collar body portion closest to the hose, and the bead of

the tube extending into the bead of the reinforcing sleeve and being arranged such that the exterior of the tube sealingly engages the interior of the reinforcing sleeve at the location of the bead, whereby fluid leakage from the free end of the tube between the exterior of the tube and the interior of the reinforcing sleeve is prevented.

3,924,884
LATCHES

John James Watson Christie, Walsall, England, assignor to Wilfrid Overton Limited, Walsall, England

Filed Apr. 8, 1974, Ser. No. 459,162
Claims priority, application United Kingdom, Apr. 7, 1973, 16798/73
Int. Cl.² E05C *3/00*
U.S. Cl. 292—196 **3 Claims**

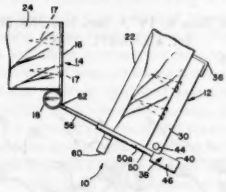


1. A slam latch for connecting a door member to a door frame member, said latch comprising a latching member pivoted about an axis and designed to be mounted on the one member (e.g. a door) and to engage a striker on the other member (e.g. a door frame), said latching member being controlled by a toggle linkage comprising first and second links pivoted together, said second link being pivoted to a point fixed in relation to said axis and said first link being pivoted to said latching member, said toggle linkage being designed to pass to an over-center position in the latched condition of the latch, and said first link including an extension beyond its pivotal connection with said latching member, said extension being placed in the path of the striker relative to said latching member whereby when the door member is slammed, said extension is engaged by the striker and displaces said toggle linkage out of its over-center condition.

3,924,885
SAFETY LATCH

Branko Markovitch, Hawthorne, Calif., assignor to Samuel P. Simmons, Lomita, Calif.

Filed Jan. 24, 1974, Ser. No. 436,099
Int. Cl.² E05C *17/04*
U.S. Cl. 292—262 **6 Claims**

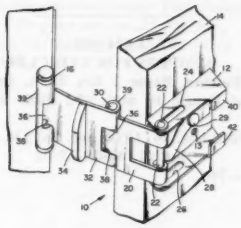


1. A safety latch for limiting the opening of a door with respect to a doorframe, comprising:
a latchplate for securement to the doorframe, said latchplate having a T-shaped engagement opening therein;
a structure for mounting upon the door, said structure comprising a base with a stop formed therein;
a guide pivotally mounted to said base, said guide having guide flanges;
an engagement link slidably mounted with respect to said guide flanges to slide from a retracted to an extended position, a stop on said engagement link to limit the amount said engagement link can clide out of said guide, said engagement link engaging with respect to said stop to retain said engagement link with respect to said base when said engagement link is in its retracted position, said engagement link also having a manually operable handle thereon, and a T-shaped engagement nose on said engagement link, said engagement nose extending into said engagement opening on said latchplate when the door is closed and said engagement link is extended with respect to said guide, said nose and said opening being configured so that said nose can engage said opening only when said engagement link is lying in said base.

3,924,886
SLIDING LINK SAFETY LATCH

Branko Markovitch, Hawthorne, Calif., assignor to Samuel P. Simmons, Lomita, Calif.

Filed Jan. 24, 1974, Ser. No. 436,097
Int. Cl.² E05C *17/48*
U.S. Cl. 292—263 **12 Claims**



1. A safety latch for mounting upon a door member and upon an associated door frame member to selectively permit the door to swing freely open or to permit the door to swing open a positively limited amount, said safety latch comprising:
a stationary latchplate for mounting on one of the door members, said latchplate having an engagement opening therein;
a base for mounting upon the other door member;
an intermediate link slidably and pivotally mounted with respect to said base;
a latch link pivotally mounted with respect to said intermediate link, said latch link having a nose for engagement into said engagement opening of said latchplate only when the door is in closed position so that said intermediate link and said latch link unfold and pivot with respect to each other and with respect to said base to limit door opening.

3,924,887
PIVOTING LINK SAFETY LATCH

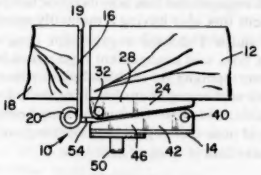
Branko Markovitch, Hawthorne, Calif., assignor to Samuel P. Simmons, Lomita, Calif.

Filed Jan. 24, 1974, Ser. No. 436,098
Int. Cl.² E05C *19/08*
U.S. Cl. 292—283 **10 Claims**

1. A safety latch for limiting the amount of opening of a door member with respect to a doorframe member, said safety latch comprising:
a base for mounting on one of the door members adjacent the edge thereof;
an intermediate link pivotally mounted on said base;
an outer link pivotally mounted on said intermediate link, said base, said intermediate link, and said outer link being

configured so that said outer link lies adjacent said base when said outer link is in its retracted position, and said outer link pivots outward away from said base to extend past said edge when in its extended position;

a latch movably mounted on said outer link;



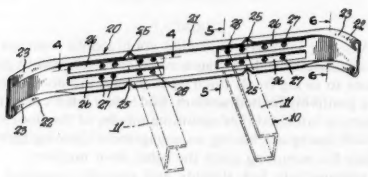
a stationary latchplate for mounting on the other door member, said latch having a nose engageable in a latch slot in said latchplate only when said outer link is in its retracted position and said nose remaining latched in said latch slot as the door opens and said links unfold to a maximum limit position which limits the maximum door opening.

3,924,888

BUMPERS FOR VEHICLES

Thomas V. Butcher, Route 2 Box 363A, Bristolville, Ohio 44406, and Donald H. Stitt, 182 Budd St., Sharon, Pa. 16146

Filed Dec. 26, 1974, Ser. No. 536,541
Int. Cl.² B60R *19/04*
U.S. Cl. 293—76 **4 Claims**



1. A bumper for a vehicle having a frame including a pair of laterally spaced beams extending longitudinally of said vehicle, and rubber-tired wheels mounted in paired relation on said frame in conventional manner so that the wheels of each pair are disposed outwardly of respective beams adjacent the ends thereof, comprising

a center bumper section rigidly secured to said frame at an end thereof and extending horizontally and crosswise of said frame beams,

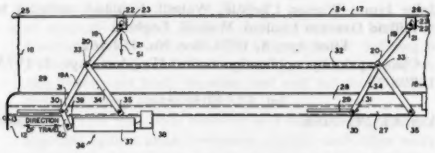
an end bumper section at each end of said center bumper section, each end section being disposed to guard an adjacent wheel of said pair of wheels against impact with an object on the road over which said vehicle travels, and leaf spring means disposed between and secured to each bumper end section and said center bumper section, constructed and arranged for disposition generally within the confines of and lying flat against said sections and operative to bias said end bumper sections to longitudinal continuity with said center section but permitting an end bumper section to be moved toward a respective wheel against the biasing force of its spring connection with said center section when said end section strikes an obstruction in the road.

3,924,889

ELEVATING MECHANISM FOR THE ROOFS OR TOPS OF VANS AND THE LIKE

Michael Gogush, 7101 Robin Blvd., R.R. No. 1, Headingly, Manitoba, Canada

Filed Jan. 3, 1975, Ser. No. 538,369
Claims priority, application Canada, Feb. 27, 1974, 193602
Int. Cl.² B60J *7/08*
U.S. Cl. 296—137 B **8 Claims**



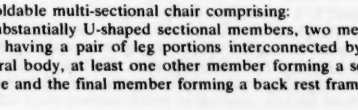
1. In a vehicle body which includes a pair of spaced and parallel side walls, a rear wall and a front wall forming an enclosure, and a roof for said enclosure, a substantially rectangular opening formed in said roof, a substantially rectangular roof panel having a pair of spaced and parallel sides and a front edge and a rear edge, flexible wall means extending from the boundaries of said opening in said roof, to the sides and edges of said panel whereby said panel can be moved substantially vertically from the closed position covering said opening, to the raised position whereby said panel is spaced vertically above said opening with said flexible walls extended; means to raise and lower said roof panel relative to said roof, said means including at least two pairs of crank arms, one pair being pivotally connected by the upper ends thereof in spaced apart relation to one side of said roof panel, the other pair being similarly connected to the opposite side of said roof panel, link means pivotally connected by the ends thereof to the crank arms of each of said pairs intermediate the ends of the crank arms, said one pair of crank arms being pivotally connected by the other ends thereof to adjacent the upper edges of the side walls of said vehicle, the said other pair of crank arms being similarly connected to the other side wall of said vehicle adjacent the upper edge thereof, anchor link means pivotally secured by one end thereof to adjacent said upper side edges of said side walls spaced from said other ends of said crank arms, and by the other end thereof to the point of pivotal connection of said link means to said crank arms and means mounting said other ends of said crank arms to said side walls for longitudinal sliding movement whereby said roof panel raises and lowers substantially vertically relative to said vehicle, an extension formed on said other ends of at least one of said pairs of crank arms and a source of power being operatively connected to said extensions.

3,924,890

FOLDABLE FURNITURE HINGE MEMBER

John William Brennan, Jr., 17866 Sierra Highway, Saugus, Calif. 91350

Filed June 8, 1973, Ser. No. 368,201
Int. Cl.² A47C *4/18*
U.S. Cl. 297—16 **7 Claims**



1. A foldable multi-sectional chair comprising:

four substantially U-shaped sectional members, two members having a pair of leg portions interconnected by a central body, at least one other member forming a seat frame and the final member forming a back rest frame;

a hinge member having at least four substantially identical links rotatably connected together, each link having a body and an inclined bearing surface that is inclined traversely to a plane containing the longitudinal length of the body, the respective bearing surfaces capable of positioning the first and third intermediate link approximately parallel along the longitudinal axis of the link bodies and the second intermediate link and fourth link approximately transverse along the longitudinal axis to the first and third links in the operative position of the foldable chair;

means for connecting each link to a respective U-shaped member including connecting the central body of the leg members to their respective links; and

means for connecting the bodies of the respective links along their longitudinal lengths so that the inclined bearing surface of each link is towards the plane containing the body of an adjacent link, the links being relatively rotatable to permit adjacent bearing surfaces that are inclined to extend into the respective rotational paths of adjacent links to permit adjacent bearing surfaces to be positioned against each other when the chair sectional members are forming an operative unit, each link connected to a chair sectional member and capable of positioning the chair sectional members in relatively parallel positions when folded into a compact position.

3,924,891

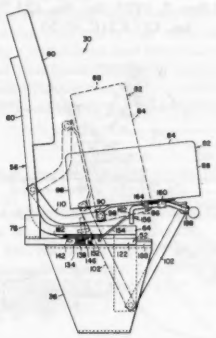
FOLDING BENCH-TYPE SEAT FOR A MOTOR GRADER

Lary Lynn Williams, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Feb. 20, 1974, Ser. No. 443,967

Int. Cl.[2] A47C *4/00*

U.S. Cl. 297—334 **3 Claims**



1. A vehicle seat structure comprising: a support frame, a seat cushion including first and second transverse contiguous surfaces extending substantially perpendicular to each other; linkage means including over-center link means connecting said seat cushion to said support frame for movement between a normal position, wherein said first seat cushion surface is generally horizontal and upwardly facing, said second seat cushion surface is generally vertical and rearwardly facing and said link means is in a collapsed condition, and a folded position wherein said first seat cushion surface is generally vertical and forwardly facing, said second seat cushion surface is generally horizontal and upwardly facing and said link means is in a slightly over-center condition tending to resist movement thereof back to said collapsed condition; said first surface including a portion which is forward of said link means when said seat cushion is in said folded position and when respectively considered with the cushion in its normal and folded positions, said first surface having a fore-and -aft dimension which is at least twice that of the second surface; said support frame including a movable portion and a fixed portion; the over-center link means being connected only to the movable frame portion having respective cooperating surface means for retaining and guiding said movable frame portion for fore-and-aft shifting movement; latch receptacle means formed in said cooperating surface means; a latch means movably mounted on said fixed frame portion and including a portion disposed for engagement with said latch receptacle means when the latch means is in a latching position to prevent movement of the movable frame portion; biasing means urging said latch means towards its latching position; said latch means being movable to an unlatched position wherein said portion thereof is free from said latch receptacle; and lever means pivotally mounted on said seat cushion and selectively swingable to engage and operate said latch means when said seat cushion is in said normal position.

3,924,892

INSTALLATION FOR DETACHABLE FASTENING OR REAR SEAT CUSHIONS IN PASSENGER MOTOR VEHICLES

Bernd Geier, Grafenau-Datzingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Aug. 7, 1973, Ser. No. 386,403

Claims priority, application Germany, Aug. 8, 1972, 2238950

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] B60N *1/02*; A47C *1/034*

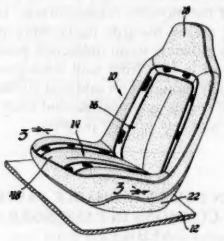
U.S. Cl. 297—440 **10 Claims**

1. An installation for detachable fastening of a rear seat cushion means, characterized in that a rear seat mounting means is provided, aperture means are provided in the rear seat mounting means, the rear seat cushion means includes a sub-frame which is provided in proximity to its forward edge with recess means, a retaining means is fixed at the rear seat mounting means and includes a head portion engaging in the recess means during the lowering of the rear seat cushion means and a base portion inserted into said aperture means provided in the rear seat mounting means, the retaining means adjusting the rear seat cushion means into a position correct as regards its location on the rear seat mounting means when the rear seat is lowered, and a spring means is provided having one bent portion on said retaining means for automatically latching the rear seat cushion means when lowered on the retaining means.

3,924,893
VENTILATED VEHICLE SEAT

Rudolph A. Ferrara, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 17, 1974, Ser. No. 515,583
Int. Cl.[2] A47C 7/02
U.S. Cl. 297—455 3 Claims

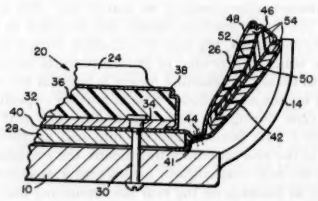


1. A vehicle seat back comprising: a frame for supporting the seat back cushion, a resilient central cushion of generally rectangular shape, first and second resilient side bolster cushions extending vertically and spaced laterally of the central cushion to provide vertically extending air passage spaces between the central cushion and the first and second side bolster cushions, a seat cover covering the central cushion, first and second seat covers respectively covering the first and second side bolster cushions, an air pervious seat covering material attached to the seat cover of the central cushion and the adjacent of the first and second side bolster cushions to bridge the air passage space therebetween, back panel means attached to the back of the seat back and providing vertically extending concave depressions aligned generally with the air passage spaces between the first and second side bolster cushions and the central cushion to provide increased leg room for a passenger seated behind the seat back, the compression of the first and second side bolster cushions and the central cushion by the weight of the seat occupant being effective to tension the air pervious material across the air passage space whereby the seat occupant is supported in spaced non-contacting relation from the supporting frame and the back panel and air circulation is provided for the seat occupant.

3,924,894
DENTAL CHAIR BACKREST WITH INTEGRAL ELBOW SUPPORTS

Azriel J. Rabinowitz, Rochester, and David B. Wilson, Holcomb, both of N.Y., assignors to Sybron Corporation, Rochester, N.Y.

Filed Oct. 7, 1974, Ser. No. 512,486
Int. Cl.[2] A47C 7/02
U.S. Cl. 297—460 3 Claims



1. An upholstered back with integral elbow supports for the backrest frame of dental chairs and the like comprising:

a. an elongated plate adapted for connection to the backrest frame;

b. first and second sheets of upholstery material fixed respectively to the front and rear surfaces of said elongated plate, portions of said sheets extending outwardly from opposite longitudinal edges of said plate to form wing portions, said first sheet being disposed over the front surface of said plate and defining the front surface of each wing portion, said second sheet comprising a pair of separate sheets defining the rear surface of each wing portion, said second sheets being connected along one edge to said plate;

c. said outward extending wing portions being stitched together along a peripherial line to form a sealed pocket, said peripherial line including a segment running generally along a major length of each of said longitudinal edges wherein said first and second sheets are placed one against the other and stitched to form hinges about which said wing portions can deflect;

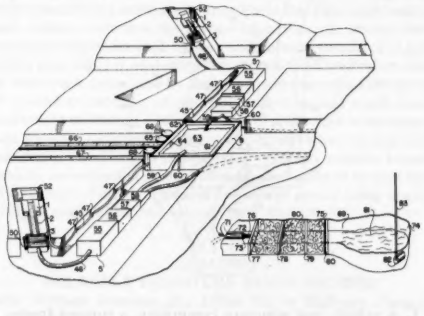
d. stiffening means in each of said pockets to rigidity the same and permit said wings to support the elbows of a patient in said dental chair, each means including a pair of stiffening members, one disposed over the other, the top one of said members being formed with a curved portion to cup the elbow of a patient in said dental chair; and

e. upholstery cushion material in each of said wing pockets and about said means to cushion said wings, a portion of said upholstery cushion material being interposed between said members.

3,924,895
METHOD AND APPARATUS FOR HYDRAULIC TRANSPORTATION OF MINED COAL

William C. Leasure, 4130 Durness Way, Houston, Tex. 77025

Filed Dec. 7, 1973, Ser. No. 422,799
Int. Cl.[2] E21C 35/20
U.S. Cl. 299—8 8 Claims



1. A method for transporting mined coal from a plurality of working faces of an underground mine to a station at the surface of said mine comprising the steps of:

dislodging said coal from said working faces by means of a mobile underground mining machine;

combining said coal with carrier liquid adjacent said working faces;

conveying said mined coal and carrier liquid by means of bifurcated conveyors to crushers fixedly mounted to modile slurrying devices;

crushing said mined coal;

admixing said crushed coal with additional carrier liquid to form slurries within said slurrying devices;

transporting said slurries to said cleaning tables;

forming clean coal slurries and waste coal slurries within said cleaning tables by removing waste coal and a part of said carrier liquid from said slurries by screening means horizontally disposed within said cleaning tables, such

that clean coal and a part of said carrier liquid remain above said screens and waste coal and a part of said carrier liquid fall below said screens;

pumping said clean coal slurries along conduits from said cleaning tables to a junction box centrally located within said underground mine;

admixing said clean coal slurries within said junction box to form an aggregate slurry;

pumping said aggregate slurry along a conduit from said junction box to said station at the surface of said underground mine by means of a pump located adjacent said junction box;

separating said slurry into clean coal and carrier liquid;

pumping said waste coal slurries along conduits away from said cleaning tables and joining said conduits with a single conduit leading to the entrance passageway of a sump so as to an aggregate waste coal slurry;

pumping said aggregate waste coal slurry from said single conduit into said entrance passageway to said sump;

separating waste coal tailings from said waste coal slurry by screening means disposed vertically within said entrance passageway;

pumping remaining liquid from said waste coal slurry upwardly along a conduit to a first settling pond located above said underground mine;

transporting said remaining liquid from said first settling pond by force of gravity to a second settling pond disposed in stepped relationship adjacent to and below said first settling pond;

transporting said remaining liquid from said second settling pond by force of gravity to a third settling pond disposed in stepped relationship adjacent to and below said second settling pond;

transporting said remaining liquid from said third settling pond by force of gravity to said station at the surface of said underground mine;

combining said remaining liquid with said remaining liquid from said clean coal slurry and pumping said combined liquid along a conduit to said junction box; and

pumping said combined liquid by pump means located adjacent said junction box along a plurality of conduits to said underground mines and said slurrying devices.

3,924,896

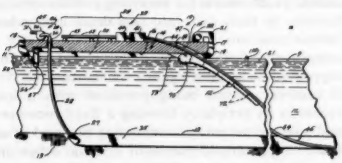
AIR CUSHION DREDGE FOR USE IN ICE-COVERED WATERS

Owen D. Blankenship, Houston, Tex., assignor to Global Marine Inc., Los Angeles, Calif.

Division of Ser. No. 276,110, July 28, 1972, Pat. No. 3,822,558. This application Apr. 22, 1974, Ser. No. 462,749

Int. Cl.[2] E02F *3/88*

U.S. Cl. 299—18 **6 Claims**



1. A method for dredging in water susceptible to being covered by a layer of ice comprising the steps of

1. locating a dredging facility on a buoyant platform adapted to be supported on a cushion of air,

2. floating the platform in the water and performing dredging operations from the platform during periods when the water is not covered by ice sufficient to restrict floating movement of the platform, and

3. during periods when the water is covered by ice sufficient to restrict floating movement of the platform, forming an opening through ice below the platform, supporting the platform on a cushion of air, and performing dredging operations from the platform through the ice.

3,924,897

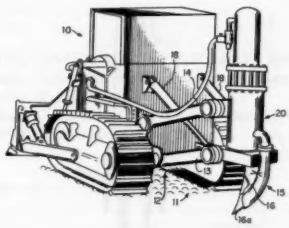
EARTH RIPPER EMPLOYING REPETITIVE EXPLOSIONS

John W. Colburn, Jr.; Charles D. Wood, III; Ronald J. Mathis, and Allan R. Nye, all of San Antonio, Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Filed Dec. 21, 1973, Ser. No. 427,039

Int. Cl.[2] E21C *47/00*

U.S. Cl. 299—36 **4 Claims**



1. An earth ripper for penetrating and fracturing earth, comprising, in combination:

a ripper shank adapted to be mounted on a tractor and including a ripper tooth mounted on the lower end thereof;

a combustion apparatus having a gas inlet, an ignition source, and a high pressure gas outlet, and adapted to be mounted on said tractor for generating repetitive discharge of gas under pressure at said gas outlet; and

a discharge conduit connected between said outlet and the lower end of said shank for conducting gas under pressure to an area adjacent to and about said tooth, said discharge conduit including an end member for connection to said ripper shank, said end member including an elongated slot for receipt of the lower end of said shank, said tooth extending outwardly from and in front of said end member in the direction of movement of said shank through the earth; and a discharge opening shielded by said tooth to prevent clogging thereof during operation of said earth ripper and disposed relative to said tooth so that gas discharged therefrom is substantially directed towards said tooth.

3,924,898

PROTECTIVE HUB CAP FOR BICYCLES

Calvin L. Kain, 1325 Rockdale Road, Bartlesville, Okla. 74003

Filed Oct. 1, 1973, Ser. No. 401,992

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] B60B *27/00*

U.S. Cl. 301—108 SC **5 Claims**

1. A hub cap for bicycle wheel axles comprising a circular hub member having a substantially S-shaped radial cross sectional configuration, said hub member being provided with a centrally disposed aperture therein, an axle attachment washer disposed within said aperture and slidably disposed on the wheel axle, and means for removably securing the washer to the hub member, and wherein the outer portion of the hub member extends outwardly away from the wheel to a point beyond the end of the wheel axle and wherein the outer edge of said hub member curves back towards the wheel thereby forming an annular protective surface around the end of the wheel axle.

5. A hub cap for bicycle wheel axles comprising a circular hub member having a substantially S-shaped radial cross sectional configuration, said hub member being provided with a centrally disposed aperture therein, an axle attachment washer disposed within said aperture and slidably disposed on the wheel axle, and means for removably securing the washer to the hub member, and wherein the outer portion of the hub member extends outwardly away from the wheel to a point beyond the end of the wheel axle and wherein the outer edge of said hub member curves back towards the wheel thereby forming an annular protective surface around the end of the

wheel axle, and wherein the washer is cylindrical in shape and is provided with an outwardly extending flange therearound and wherein the means for removably securing the washer to the hub member comprises an annular groove disposed within the hub member aperture, a flared recess provided in the outer end of the aperture between the outer face of the hub member and the groove, the diameter of the cylindrical washer is substantially equal to the diameter of the aperture and the diameter of the flange is substantially equal to the diameter of the groove whereby the cylindrical washer is inserted into the aperture and the flange is passed through the flared recess and snapped into the groove within the aperture.

3,924,899

AUTOMATIC CHOKE RELIEF VALVES SYSTEM FOR PNEUMATIC CONVEYANCE

Felipe Salete, Cerro de Macuiltepec No. 449, Col. Campestre Churubusco, Mexico City, Mexico

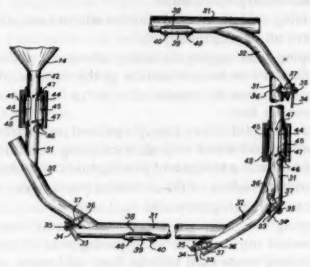
Filed Sept. 21, 1973, Ser. No. 399,586

Claims priority, application Mexico, July 27, 1973, 145167

Int. Cl.[2] B65G *53/66*

U.S. Cl. 302—35 **16 Claims**

1. A duct system for pneumatic conveyance of milling products, comprising a conveying line constituted by straight horizontal portions each formed with an opening, straight vertical portions each formed with opposite openings, and change of direction portions joining the straight horizontal and vertical portions, and the system also comprising a plurality of circularly curved plates associated respectively with said openings in said straight horizontal portions and said openings in said straight vertical portions, and suspension means suspending the plates from said conveying line so that each plate is movable under influence of pressure difference between the interior of the conveying line and the exterior thereof between a position in which the plate covers the opening with which it is associated to close off said opening and a position in which it



does not close off said opening, so that each plate provides an automatically-operating relief valve.

3,924,900

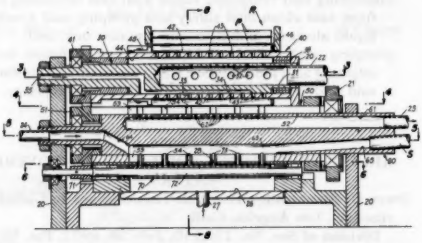
FEED MECHANISM FOR PNEUMATIC CONVEYOR SYSTEMS

Gerald Mason Eisenlohr, Richmond, Va., assignor to AMF Incorporated, White Plains, N.Y.

Filed July 10, 1974, Ser. No. 487,116

Int. Cl.[2] B65G *53/46*

U.S. Cl. 302—49 **10 Claims**



1. A mechanism for feeding rod-like articles to a pneumatic conveyor, comprising

rotatable drum means for receiving rodlike articles moving laterally to their axes into said drum means one by one from a reservoir,

receiver means being disposed within said drum means and supported at its ends against movement,

said receiver means being provided with a longitudinal recess in its periphery forming a fixed receiver chamber and passage means for connecting one end of said chamber to a pneumatic conveyor and the other end of said chamber to a source of pressure air for causing rod-like articles to move axially out of said chamber into the conveyor,

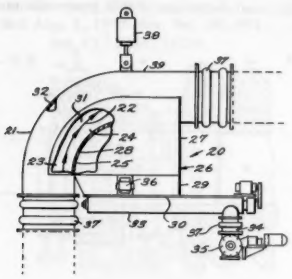
said drum means rotating relative to said receiver means thereby moving each of said articles into alignment adjacent said receiver chamber with the axis of the aligned article parallel to the axis of said receiver chamber, and cam means connected to rotate in timed relation with said drum means and urging a rod-like article to move laterally to its axis into said receiver within said drum means each time said drum means moves a rodlike article into alignment with said receiver chamber.

3,924,901

PARTICLE BUILD UP SUPPRESSOR

Woodrow W. Phillips, 3136 Clairmont Road NE., Atlanta, Ga. 30329

Filed May 3, 1973, Ser. No. 356,808
Int. Cl.[2] B65G 53/52
U.S. Cl. 302—64 34 Claims



29. A device for use in a conduit system having a conduit bend that changes the direction of a generally vertical flow-path of a pressurized stream of fluid containing suspended particles to a generally horizontal flowpath, the conduit bend having an inner wall at the bend thereof that includes an outer radius segment and opposite thereto an innner radius segment so that as the stream changes direction a high velocity-energy region will be formed adjacent the outer radius and a low velocity-energy region at the inner radius comprising:

a collection means connected to the inner radius for trapping the particles that settle from the high velocity-energy region of the conduit bend to the low velocity-energy region of the conduit bend thereby preventing the build-up of particles at the inner radius segment;

a vibration means operatively attached to said collection means for preventing build-up of particles along the inner walls of said collection means by vibrating said collection means;

means connected to the conduit bend for isolating vibration of said collection means produced by said vibration means from the remainder of the supporting conduit system;

said vibration isolating means comprising:

a spring-hanger connected to the conduit bend and flexible joints connected at least at each end of the conduit bend.

34. A fin-like separator device operatively connected with the internal wall of a conduit, which conduit system has conveyed therethrough a pressurized stream of fluid medium containing suspended particles, the fin like separator device comprising:

a snub means having a generally flat surface which is inclined at a compound angle relative to the longitudinal axis of the conduit from the inner wall of the conduit where said device is mounted, simultaneously in these two senses:

a. proceeding along the generally flat surface from nearer the conduit internal wall towards the longitudinal axis of the conduit, the generally flat surface inclines downstream, to increase the incidence of collision of the suspended particles in the stream by deflecting suspended particles which are near the internal wall towards the center of the stream when the generally flat surface faces the stream and the stream impinges thereon;

b. proceeding along the generally flat surface transversally of the longitudinal axis of the conduit, the generally flat surface is inclined laterally towards one side for providing lateral deflection of the suspended particles when the generally flat surface faces the stream and the stream impinges thereon;

and an aerodynamic surface means, arched transversally and inclined in an opposite sense to the sense (a), said aerodynamic surface means extending from the internal wall to a generally arch-shaped juncture with said generally flat surface of the snub means, for deflecting said suspended particles when said aerodynamic surface means, but not the snub means, faces the stream and the stream impinges on the aerodynamic surface means,

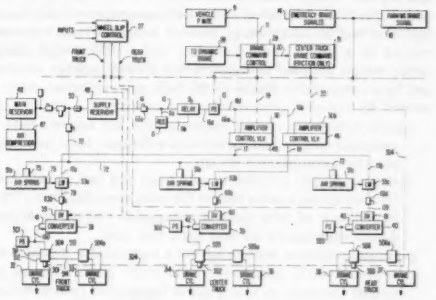
said opposite inclination of the generally flat surface and said aerodynamic surface means resulting in alternative use of the generally flat surface and the aerodynamic surface means, depending upon which direction the stream of fluid medium is being conveyed through the conduit, and, correspondingly, whether the stream impinges upon the generally flat surface or upon the aerodynamic surface means.

3,924,902

BRAKING SYSTEM FOR A LIGHT RAIL VEHICLE

Thomas Engle, Cape Vincent, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Continuation-in-part of Ser. No. 393,529, Aug. 31, 1973, Pat. No. 3,845,991. This application June 17, 1974, Ser. No. 480,441
Int. Cl.[2] B60T 8/04
U.S. Cl. 303—21 A 16 Claims



1. A brake system for vehicles having at least one axle with friction and dynamic brakes and at least one axle with only friction brakes, said system comprising: fluid operated friction brake means for said vehicle, said friction brake means including means responsive to variations in fluid pressure to actuate said friction brake means, said brake means having:

first and second pressure-responsive fluid motors, said first fluid motor being responsive to positive fluid pressure variations to actuate said brake means;

spring motor means responsive to reductions in fluid pressures applied to said second fluid motor to actuate said brake means;

a first fluid pressure control means for providing variations in the fluid pressure applied to the first pressure-responsive fluid motors of said axle having friction and dynamic brakes, said first control means responding to a supplied signal which is inversely proportional to the amount of dynamic braking effort applied to said axle;

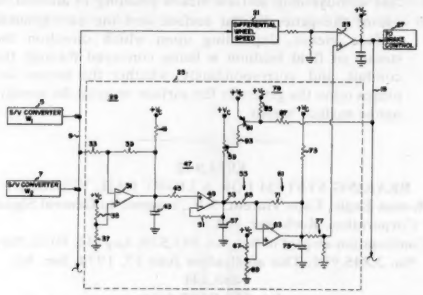
a second fluid pressure control means for providing fluid pressure to the first pressure-responsive fluid motors of said axle having friction brakes, said second control means responding to a supplied signal which is independent of the amount of braking effort applied to said axle with friction and dynamic brakes; and

a third fluid pressure control means for providing reductions in fluid pressure to said second fluid motors, said third pressure control means being responsive to both emergency braking control signals and parking brake control signals.

3,924,903
DUAL SLOPE RAMP CIRCUIT FOR ANTI-SKID CONTROL CIRCUITRY

Lucian F. Emerson, Williamsport, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed May 6, 1974, Ser. No. 467,273
Int. Cl.² B60T *8/08*
U.S. Cl. 303—21 BE **5 Claims**



1. In a wheeled vehicle anti-skid control circuit having first and second voltage sources representative of first and second wheel speeds; acceleration and deceleration means coupled to said first and second voltage sources and to a logic rail connected to a brake control means; and a differential wheel speed means coupled to the first and second voltage sources and by a comparator means to the logic rail and brake control means; an anti-skid control cirucit comprising:

passive integrator circuit means connected intermediate a potential source and a potential reference level and coupled to a comparator means;

switching means coupled to said logic rail and to said passive integrator circuit means for selective alteration of the impedance of said passive integrator circuit in accordance with signals on said logic rail; and

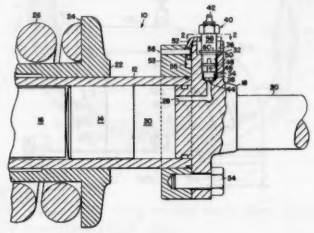
potential regulator means having a comparator means with a non-inverter junction, an inverter junction, and an output coupled to said passive integrator cirucit means and by way of an impedance to said inverter junction and to said first and second voltage sources representative of said first and second wheel speeds, said potential regulator means effecting control of the energy supplied to said passive integrator circuit from said potential source in accordance with the potential provided by one of said first and second voltage sources.

3,924,904
GREASE FITTING ASSEMBLY INCLUDING SAFETY STOP

Joseph Francis Wagner; Ross Thomas Broderick, both of Dubuque; Joseph Edward Link, Farley, and David Emmert Stover, Dubuque, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed May 1, 1974, Ser. No. 465,996
Int. Cl.² B62D *55/18*; **F15B** *13/04*
U.S. Cl. 305—10 **4 Claims**

1. In a hydraulic track adjustor of a type including a cylinder, a piston slidably mounted in the cylinder and cooperating therewith to define an expandible and retractable grease-receiving chamber, a first passage, including a threaded bore section beginning at the exterior of the adjustor, leading to the chamber, the bore section having an inner end defining a valve seat facing outwardly, a grease inlet valve fitting threadedly received in the bore section, a relief port intersecting the bore section at a location spaced axially from but located adjacent to the valve seat, said grease inlet valve fitting having an inner end portion dimensioned so as to cooperate with the bore section to define a relief passage leading from the valve seat to the relief port, and said grease inlet valve fitting being movable between a fully inserted position wherein its inner end engages the valve seat and prevents grease from flowing from the chamber to the relief port and a first partially unscrewed position permitting grease to flow from the chamber to the relief port, the improvement comprising: said grease inlet valve fitting having axially extending groove means extending towards the outer end thereof from the inner portion thereof; the axial dimension of said groove means being such

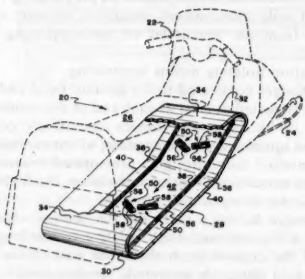


that it is not in fluid communication with the outer end of the bore section when the grease inlet valve fitting in is said first partially unscrewed position but is in fluid communication with the outer end of the bore section when the grease inlet valve fitting is unscrewed from said first unscrewed position to a second partially unscrewed position whereby an alternate passage for permitting grease to flow from the chamber is provided for cases when foreign matter prevents grease from flowing through the relief port.

3,924,905
REMOVAL OF OBSTRUCTING SNOW FROM WITHIN SNOWMOBILE TRACK ENCLOSURES

Verlin M. Simmons, 495 S. Main, Providence, Utah 84332

Filed Oct. 21, 1974, Ser. No. 516,314
Int. Cl.² B60S *1/62*
U.S. Cl. 305—12 **6 Claims**



1. A snowmobile comprising:

a prime mover;

an endless belt track having inside and outside surfaces and upper and lower legs and being connected at said inside surface by drive means to and rotated by the prime mover, the outside surface powering the snowmobile by engagement with the snow;

snow plow means secured to the inside surface of the belt track and projecting into the enclosure between said upper and lower legs, the snow plow means being carried during rotation by the belt track and extending angularly across the belt a distance less than the full width of the belt so as to both (a) avoid interference with the drive means and (b) engage, loosen and plow snow from within

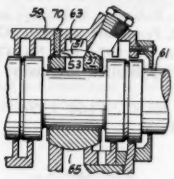
the enclosure between said upper and lower legs and the ends of the endless belt track.

3,924,906

ELECTRICALLY INSULATED BEARING AND FOR REDUCING SHAFT CURRENT

Hiroo Kitaoka, Chesterland, Ohio, assignor to Reliance Electric Company, Cleveland, Ohio

Filed Aug. 1, 1973, Ser. No. 384,491
Int. Cl.² F16C *33/00*
U.S. Cl. 308—1 R **5 Claims**



1. A bearing electrically insulated from a stator surface, comprising in combination:

bearing means for journalling rotor means,

said bearing means having a bearing surface for mounting to the stator to have said bearing and stator fixed for non-rotation relative to one another during rotation of said rotor means,

said bearing means having a bearing babbitt with a first melting point which bearing babbitt is thermally coupled to said bearing surface,

a ceramic insulating means having a second melting point greater than said first melting point and hot sprayed to said bearing surface to provide a support layer for the bearing and to electrically insulate the bearing from the stator with an insulator having a higher melting point than said bearing babbitt;

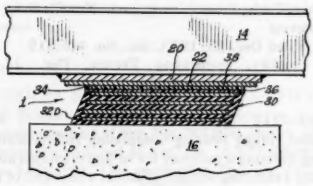
and a second insulator impregnated into said ceramic insulating means to prevent contamination thereof.

3,924,907

BEARING PAD AND BRIDGE CONSTRUCTION

Daniel E. Czernik, Hinsdale, and Donald J. McDowell, Riverside, both of Ill., assignors to Felt Products Mfg. Co., Skokie, Ill.

Filed Oct. 29, 1974, Ser. No. 518,594
Int. Cl.² F16C *29/02*
U.S. Cl. 308—3 R **18 Claims**



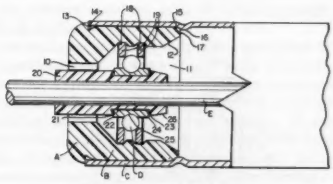
1. A bearing pad for supporting the weight of a load bearing member upon a support structure and for compensating for and accommodating movement of a load bearing member relative to a support structure and being adapted to confront and bear against a slide plate surface, said bearing pad comprising a main body portion, an intermediate layer and a polytetrafluoroethylene layer, said main body portion comprising an elastomeric material having a durometer of from about 40 to about 65 and being adapted to be supported between a said load bearing member and a said support structure, said main body portion having an upper and a lower surface and at least one expansive shim plate lying between said upper and lower surfaces and immediately underlying said intermediate layer, said intermediate layer comprising a non-metallic compressible material which is substantially less compressible than said elastomeric material and which has a greater tension limiting strength under compressive loading than does the upper portion of said elastomeric material, thereby to restrict tensioning of the polytetrafluoroethylene when the bearing pad is compressively loaded, said intermediate layer being bonded to the upper surface of said main body portion in close proximity to the uppermost expansive shim plate, said layer of polytetrafluoroethylene being bonded to the upper surface of said intermediate layer and providing an upper slide surface adapted slidably to engage a confronting slide plate surface for slidably accommodating movement of a said load bearing member relative to a said support structure.

3,924,908

ROLLER WITH INSERTED BALL BEARINGS

Robert W. Gotham, and Robert J. McKnight, both of Toms River, N.J., assignors to Unex Conveying Systems, Inc., Toms River, N.J.

Filed Dec. 7, 1973, Ser. No. 422,794
Int. Cl.² F16C *33/58*
U.S. Cl. 308—20 **4 Claims**

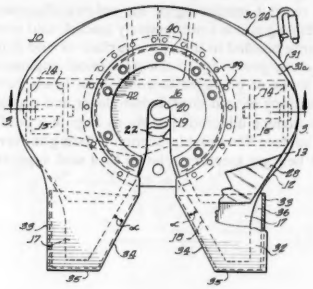


3. A cartridge-type ball bearing including a plastic housing containing a conical opening at one end and at least one internal annular groove with inclined side walls into which groove a bearing outer raceway is pressed, said raceway consisting of at least one ring, said ring forming at least a part of a groove which serves as said outer ball race way.

3,924,909
FIFTH WHEEL

John Allen Kent, Rolling Prarie, Ind.; Robert B. Love, Park Forest, and Harold Louis Meyer, Deerfield, both of Ill., assignors to Amsted Industries Incorporated, Chicago, Ill.

Filed Jan. 20, 1975, Ser. No. 542,261
Int. Cl.² B62D 53/08
U.S. Cl. 308—136 6 Claims

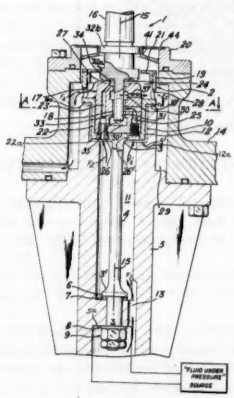


1. In combination, a fifth wheel for a trailer truck having a fifth wheel plate, a liner of low friction material riding on the fifth wheel plate, and a cover plate assembled over said liner, said cover plate being pivotally mounted on said fifth wheel plate.

3,924,910
DAMPENED VERTICAL SPINDLE

René Bourassin, Neauphle le Chateau, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed July 9, 1973, Ser. No. 377,402
Claims priority, application France, July 13, 1972, 72.25549
Int. Cl.² F16C 17/10, 33/80, 35/08, 37/00
U.S. Cl. 308—156 10 Claims

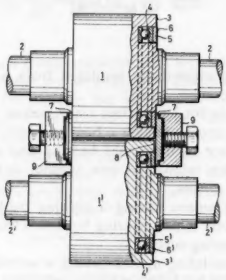


1. A damped pivot for machines which rotate at high velocities, wherein said pivot comprises in combination:
a bearing,
an elastic restoring and centering member acting on said bearing to support elastically and acting to restore to center said bearing during operation,
said bearing comprising a shaft and defining a bearing bore, said shaft being disposed in said bearing bore with a clearance;
a film of fluid under pressure, provided in said clearance to guide and damp the pivot;
a casing means including
a base and surrounding said bearing,
said base defining a damping chamber, a contiguous feed chamber, and pressure fluid ducts interconnecting said chambers.

3,924,911
SEALING DEVICE

Dietrich Bumberger, Bobingen, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 11, 1974, Ser. No. 478,221
Claims priority, application Germany, June 13, 1973, 2329978
Int. Cl.² F16C 33/76
U.S. Cl. 308—187.1 4 Claims



1. An end-face sealing device between, on the one hand, rotating pairs of rolls and, on the other, stationary chambers, which comprises
a. sealing elements fitted in the end-faces of the rolls, being adjustable in the axial direction of the rolls and prevented from turning with the rolls,
b. sealing plates fitted in the side walls of the chambers in such a manner that they are pressed on the said sealing elements, and
c. devices for pressing said sealing plates on the said sealing elements.

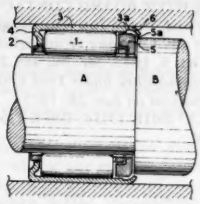
3,924,912
ROLLING BEARING CAPABLE OF FIXING THE AXIAL POSITION OF A MACHINE ELEMENT

Alfred Pitner, Paris, France, assignor to Nadella S.A., France, a part interest

Filed Dec. 18, 1973, Ser. No. 425,819
Claims priority, application France, Dec. 22, 1972, 72.46068
Int. Cl.² F16C 13/00
U.S. Cl. 308—212 9 Claims

1. A radial rolling bearing comprising rolling elements, a bearing ring defining a raceway for rolling elements and defining a radially extending surface adjacent a first end of the ring, a cage co-operative with the rolling elements to guide the rolling elements, a washer for combination with means defining an inner raceway for the rolling elements, the washer defining an abutment surface and disposed inside the ring adjacent a second end of the ring opposed to said first end of the ring and freely movable axially of the ring, and retaining means combined with the ring adjacent said second end for axially retaining the washer within the ring, the rolling elements being capable of axially bearing at one end against the radial surface of the ring and at an opposite end against the

abutment surface of the washer, the washer projecting inwardly of the ring radially beyond the retaining means so that although the washer is retained by the retaining means a part of the washer is exposed and capable of receiving an axially-



directed thrust from a member outside the bearing ring, whereby said thrust is transmitted to said surface adjacent the first end of the ring through the washer and the rolling elements.

3,924,913

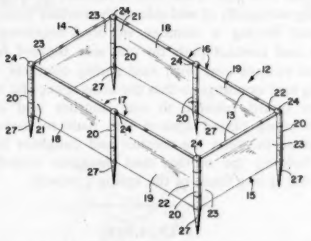
GARBAGE CAN ENCLOSURE DEVICE

Frederick Cooper, Scarborough, Canada, assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Nov. 20, 1974, Ser. No. 525,686

Int. Cl.[2] A47B *47/00*; B65F *1/00*

U.S. Cl. 312—258 **3 Claims**



1. A foldable garbage can enclosure device adapted to receive therein a plurality of garbage cans, which comprises:

a. a plurality of elongated type hinge assemblies;

b. vertical front and rear walls, each said front and rear walls formed from two rectangularly shaped panels joined together with one said hinge assemblies;

c. a pair of vertical end walls, said end walls joined to said rear and front walls with a plurality of said hinge assemblies into a rectangularly shaped frame;

d. a means for anchoring said enclosure device into the ground.

3,924,914

ELECTRICAL SAFETY GROUNDING DEVICE MEANS

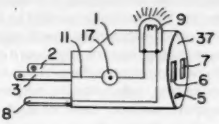
Philip M. Banner, 28 Oxford Road, Massapequa, N.Y. 11758

Continuation-in-part of Ser. No. 204,826, Dec. 6, 1971, which is a continuation-in-part of Ser. No. 16,477, March 4, 1970, Pat. No. 3,626,354. This application Dec. 28, 1973, Ser. No. 429,104

Int. Cl.[2] H01R *3/06*

U.S. Cl. 339—14 P **14 Claims**

1. An electrical safety grounding device means of the type for two and three wire electrical systems having a receptacle comprising a conductive cover plate for said receptacle, means to ground said plate, and a plug adapted to plug into said receptacle, a ground contact on said plug adapted to contact said grounded plate, and fuse protection in said plug connected to a current carrying wire, and ground indicating means connected to said wire and said ground on said plug, wherein the receptacle is an adapter having a receptacle on



one end having a grounding contact and a connector body on the other end connected to wiring.

3,924,915

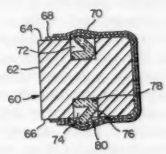
ELECTRICAL CONNECTOR

Richard A. Conrad, San Marcos, Calif., assignor to Teledyne, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 202,526, Nov. 26, 1971, abandoned. This application June 14, 1973, Ser. No. 369,896

Int. Cl.[2] H01R *11/02*; H05K *1/02*

U.S. Cl. 339—17 F **2 Claims**



1. An electrical connector for making electrical connection with a series of electrical conductors on a printed circuit board or the like, comprising, in combination:

a body member including a surface adapted to be secured adjacent a series of electrical conductors, said surface having a longitudinal groove therein extending along at least a portion of its length;

a sheet of insulative material having a front surface and a back surface and having a plurality of electrically conductive contact members secured to and exposed from said front surface;

means securing said back surface of said sheet of insulative material to said surface of said body member; and

means for urging said sheet of insulative material away from said surface of said body member and for providing a wiping action along said back surface of said sheet of insulative material in the direction parallel to said plurality of conductive contact members, said last mentioned means comprising a resilient member having a V shaped cross-section having first and second legs positioned in said groove.

3,924,916

CONNECTOR ADAPTER

John T. Venaleck, Mentor, Ohio, assignor to A & P Products Incorporated, Painesville, Ohio

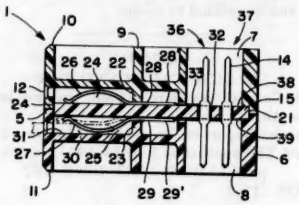
Filed Feb. 19, 1974, Ser. No. 443,307

Int. Cl.[2] H05K *1/00*; H01R *13/50*

U.S. Cl. 339—17 LC **10 Claims**

1. A connector adapter for electrical and mechanical connection of a plurality of electrically conductive pins arranged in a first array pattern respectively to a plurality of electrically conductive contacts arranged in a second array pattern, comprising an electrically non-conductive housing, a substantially planar electrically non-conductive support surface in said housing, a plurality of electrically conductive paths on said support surface, a plurality of connector contacts arranged in first spaced-apart positions on said support surface and extending in a direction substantially parallel to the plane of said

support surface, each connector contact having a first portion electrically connected to a respective electrically conductive path and a second portion positioned for mechanical engagement with a respective electrically conductive pin that is inserted in a direction substantially parallel to the plane of said support surface to effect substantial mechanical engagement, a plurality of upstanding electrically conductive connector pins supported by said support surface at second spaced-apart positions and extending substantially perpendicular to the plane of said support surface, each of said connector pins having a first portion electrically connected to a respective

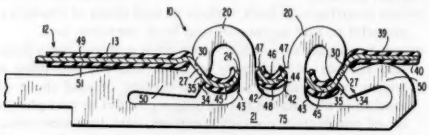


electrically conductive path and a second portion positioned for mechanical engagement with a respective electrically conductive contact that is inserted in a direction substantially perpendicular to the plane of said support surface to effect substantial mechanical engagement, said second portions of said connector pins being positionally arranged with respect to each other in such second array pattern, said plurality of electrically conductive paths on said support surface thus electrically connecting respective connector contacts and connector pins, and at least a portion of each of said connector contacts and connector pins being retained in said housing.

3,924,917
FLAT CABLE TERMINATION METHOD AND APPARATUS

Kenneth Munshower, Norristown, Pa., assignor to Elco Corporation, Willow Grove, Pa.

Filed Apr. 30, 1974, Ser. No. 465,593
Int. Cl.[2] H01R *9/08, 11/08*
U.S. Cl. 339—17 F **14 Claims**



1. A contact apparatus for flexible flat conductor means comprising:

penetrating means for penetrating completely through a conductor portion of the said flat conductor means at any preselected location on said flat conductor means to provide thereat a first electrical contact between said conductor portion and said contact apparatus; and

conductor engagement means for engaging said conductor portion at a location remote from said penetration at said preselected location, said engagement means comprising: a remote engagement portion of said penetrating means; abutment means for providing a reaction surface against which said flexible flat conductor means may be supported when said engagment portion engages said conductor portion;

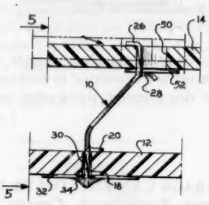
said engagement portion and said abutment means being operable to penetrate at least a portion of an insulative covering of said conductor portion at said remote location to provide thereat a second electrical contact between said conductor portion and said contact apparatus;

said penetrating means including nub means projecting therefrom and establishing said first electrical contact.

3,924,918
DAUGHTER BOARD CONTACT

Lindsay Carlton Friend, Camp Hill, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 9, 1973, Ser. No. 404,290
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] H01R *13/54;* **H05K** *1/04*
U.S. Cl. 339—17 M **4 Claims**

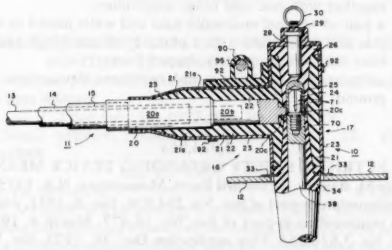


1. A daughter board contact system comprising a mother board, a number of terminals secured to the mother board in spaced relation and extending from one side thereof with each terminal including a link-arm and a daughter-board engaging hook at the free end of the arm, a number of spring contacts extending outwardly of said side of the mother board, a daughter board having a number of hook-receiving openings thereon and contact pads on one side thereof for forming electrical connections with said spring contacts, the hooks engaging said openings so that the arms space the mother and daughter board relative to one another and said spring contacts being biased against said pads to form electrical connections between the mother and daughter boards, and means holding the mother and daughter boards together against the spring force of the spring contacts.

3,924,919
DISCONNECTABLE ELECTRICAL CONNECTOR

James E. McClain, Greenville, Tex., assignor to Esco Manufacturing Company, Greenville, Tex.

Filed Dec. 15, 1972, Ser. No. 315,637
Int. Cl.[2] H01R *11/02*
U.S. Cl. 339—60 C **6 Claims**



1. Electrical connecting apparatus for disconnectably electrically coupling a high voltage electrical cable with electrical apparatus, comprising:

a. cable connecting means including an elongated first central conductor axially extending through an insulating jacket and adapted for coaxial termination with said cable, said first central conductor having an extending end portion thereof with an opening defined in said end portion; conductive body means rigidly affixed to said

end portion and having a socket therein aligned with said opening; an insulating support body; said conductive body means disposed within said insulating support body; a conductive plug disposed within the base of said insulating support body and having an end portion spaced from said conductive body means, said conductive plug providing a conductive test point for said electrical connecting apparatus,

b. bushing assembly means including an elongated second central conductor axially extending through an insulating jacket for electrical connection with said electrical apparatus,

c. said second central conductor having socket engaging means provided at one end thereof, said socket engaging means comprising a plurality of conductive resilient extensions which extend through said opening into said socket, and

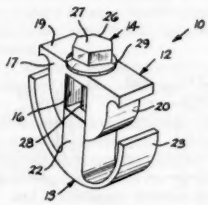
d. means attached to said cable connecting means to enable the lifting of said cable connecting means out of coupling engagement with said bushing assembly.

3,924,920

DEVICE FOR CLAMPING ELONGATED MEMBER

Richard Joseph Moscioni, Linden, and Gerald Miller Sellar, Warren, both of N.J., assignors to Western Electric Company, Inc., New York, N.Y.

Filed June 10, 1974, Ser. No. 477,709
Int. Cl.² H01R 7/24
U.S. Cl. 339—246 **8 Claims**



1. A device for clamping at least one elongated member, which includes:

a base having an arcuately shaped surface;

a cover adapted to be secured to the base and having an arcuately-shaped surface complementary to the arcuately formed surface of the base when the cover is secured to the base to form a generally elongated arcuately shaped opening having a substantially constant width for receiving an end portion of at least one elongated member with the end portion of the elongated member between the complementary surfaces being essentially linear; and

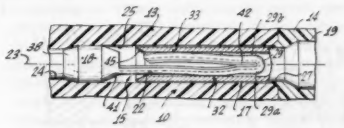
means securing the cover to the base for causing forces to be applied to each elongated member inserted into the arcuately shaped opening to abrade portions of the surfaces of each member and for causing substantially equal clamping forces to be applied to each elongated member, the end portion of each elongated member remaining essentially linear after the cover has been secured to the base.

3,924,921

ELECTRICAL-PIN-AND-SOCKET CONNECTOR

Lewis Clark Feightner, Chatsworth, Calif., assignor to New Twist Connector Corporation, Santa Monica, Calif.

Continuation-in-part of Ser. No. 211,586, Dec. 23, 1971, abandoned, which is a continuation-in-part of Ser. No. 65,452, Aug. 20, 1970, abandoned. This application Oct. 15, 1974, Ser. No. 514,605
Int. Cl.² H01R 13/06
U.S. Cl. 339—252 P **36 Claims**



1. For use in an electrical connector assembly, a pin connector composed of electrically conductive sheet metal of substantially uniform thickness, and extending generally along a preselected longitudinal axis, comprising:

an elongated, tubular sheet metal body forming a base portion of said connector and extending along said axis, said body having means adjacent one end thereof for connection to an electrical conductor;

and an elongated sheet metal pin contact integrally connected to the other end of said body, and including:

a first resiliently flexible contact arm joined to said one end of said body and extending away from the latter toward the opposite end of said pin contact, said first arm having a laterally facing outer side of convex curvature in transverse cross-section, and extending along one side of said axis to a first contact area closer to said opposite end than to said body, said first arm being inclined away from said axis toward said first contact area, and then extending back toward the axis,

a generally U-shaped, reverse bend joined to the end of said first arm beyond said first contact area, and having two legs disposed in side-by-side relation and joined together by a rounded nose, said nose being offset from said axis on the same side thereof as said first arm, one of said legs being integrally joined to said first arm,

and a second resiliently flexible contact arm integrally connected to the other of said legs and extending from the latter back toward said body, in laterally spaced relation with said first leg, and terminating in a free end adjacent said body but spaced therefrom,

said second contact arm having an outer side facing laterally away from said first arm and of convex curvature in transverse cross-section, and being inclined from said second leg away from said first arm and across said axis to a second contact area that is closer to said free end than to said opposite end, whereby said contact areas are longitudinally offset along said pin contact, and both of said arms flex along substantial lengths thereof.

3,924,922

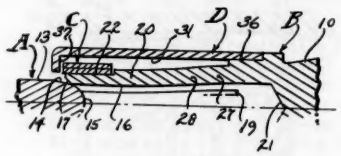
CONSTRICTOR BIASED ELECTRICAL PIN AND SOCKET TYPE CONNECTOR

Herbert A. DeCenzo, 3719 Cannon Ave., Las Vegas, Nev. 89121

Filed Apr. 26, 1971, Ser. No. 137,279
Int. Cl.² H01R 11/22
U.S. Cl. 339—259 R **2 Claims**

1. A hooded pin and socket connector wherein a male pin member is frictionally slidable into a female receptacle member, the male member having an exterior diameter of right cylinder form and the female receptacle member having an interior diameter of right cylinder form, said exterior and interior diameters of the two said members being of substan-

tially the same diameter for coextensive interface engagement, the said female receptacle member having an outer diameter of right cylinder form concentric with said interior diameter forming a wall open at one end to receive the male pin member, there being slots through the said wall from said open end and substantially coextensive with the depth of penetration of said male pin member therein and thereby severing the female receptacle member into a plurality of radially movable longitudinally disposed circumferentially adjacent contact fingers fixedly rooted in said female receptacle member, and a laminiform spring-damper of right cylinder



form embracing the said contact fingers and comprising concentrically wrapped inner and outer frictionally engaged convolutions and one convolution integrally continuing from the other by means of an angularly disposed member extending therebetween and the inner convolution engageable with the outer diameter of said female receptacle, and a cylindrical hood carried on and extending from the base and spaced from the outer wall of the female receptacle member and having an inner diameter wall engageable with the outer convolution of the laminiform spring-damper stopping its lateral expansion when the female receptacle member reassumes right cylinder form.

3,924,923

FLAT CABLE ELECTRICAL CONNECTIONS AND METHODS OF MAKING SAME

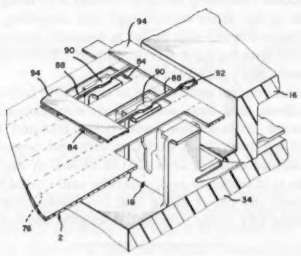
John Robert Shoemaker, Walkerton, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed June 8, 1973, Ser. No. 368,387

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] H01R 9/06, 31/02

U.S. Cl. 339—278 M **2 Claims**



1. A continuous strip of stuffer members, each of said stuffer members being adapted to be inserted into the conductor-receiving slot of a contact terminal member for the purpose of retaining a conductor in the slot, said strip comprising:

two spaced-apart parallel co-planar carrier strips of polymeric insulating material,

said stuffer members each comprising a stuffer pin which is adapted to be moved laterally of its axis against a conductor and into said slot, each of said pins comprising a flat sheet metal member having parallel side edges, an enlarged center section, and enlarged ends,

said stuffer members extending between said strips of polymeric insulating material ladder-rung fashion, said stuffer members being spaced apart along the length of said carrier strips and having said enlarged ends adhered to said strips whereby,

upon positioning each of a plurality of conductors in alignment with the slots of each of a plurality of contact terminals, and upon positioning a section of said stuffer strip proximate to said conductors with one stuffer pin parallel to each of said conductors, and upon subsequently moving said section of stuffer strip towards said conductors and then moving said stuffer strip and said conductors into said slots, said conductors will be engaged by the edges of said slots and thereby establish electrical contact with said terminals, and said stuffer pins will retain said conductors in said slots.

3,924,924

HOLOGRAPHIC MEMORY UTILIZING A CHANGEABLE PHASE OBJECT AND COHERENT SUBTRACTION

Akira Fukuhara, Tachikawa, Japan, assignor to Hitachi, Ltd., Japan

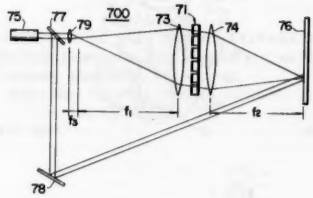
Division of Ser. No. 206,391, Dec. 9, 1971, Pat. No. 3,781,084. This application Sept. 18, 1973, Ser. No. 398,551

Claims priority, application Japan, Dec. 9, 1970, 45-108530; Dec. 25, 1970, 45-130687

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] G03H 1/16, 1/26

U.S. Cl. 350—3.5 **8 Claims**



3. A hologram preparing apparatus comprising:

an interferable-light source;

a beam splitter which is arranged in an optical path of an interferable light beam emitted from said interferable-light source;

a pattern generating device including a plurality of reversible phase-modulating elements each comprising

an irregular ferroelectric crystal plate in which each set of mutually opposing end planes are normal to one of *a*-, *b*- and *c*-axis, and a thickness between said end planes is prescribed with respect to a difference Δn in the refractive index between light beams having wavelength λ and having their polarization planes respectively parallel to said *a*- and *b*-axis within the crystal and to a positive integer P by

$$\frac{\lambda}{2 \cdot \Delta n}(P = \tfrac{1}{2}), \text{ and}$$

means for applying a voltage, sufficient to invert the spontaneous polarization of said irregular ferroelectric crystal plate by 180°, to said irregular ferroelectric crystal plate and in parallel to said *c*-axis,

polarizing means which is arranged in front of and in opposition to one end plane of one set of said mutually opposing end planes of said irregular ferroelectric crystal plate of said reversible phase-modulating element, a polarization plane of said polarizing means being arranged in parallel to one of said *a*- and *b*-axis of said end planes of said irregular ferroelectric crystal plate, said irregular ferroelectric plates, which constitute the respective elements, being arranged on a plane normal to incident light, one of said *a*- and *b*-axis on one set of said mutually opposing end planes of said each crystal plate being arranged in parallel to a predetermined linear polarization plane, which is arranged in an optical path of one of the light beams split by said beam splitter, and which has the split light beam as the incident light beam;

a Fourier transform lens which is arranged in said optical path of said light beam split by said beam splitter, and immediately adjacent said pattern generating device;

a hologram recording medium which is arranged at a rear focalposition of said Fourier transform lens;

polarizing means which is arranged in the other beam path split by said beam splitter; and

optical means which directs the linearly polarized beam, having passed through said polarizing means, to said hologram medium at a predetermined angle,

whereby a hologram of a pattern image of said pattern generating device is prepared.

5. A method of preparing a hologram with a hologram preparing apparatus including a interferable-light source;

polarizing means which is arranged in an optical path of light beam emitted by said interferable-light source, and which converts said interferable light beam into a linearly polarized beam;

a beam splitter which is arranged in an optical path of said linearly polarized beam converted by said polarizing means;

a pattern generating device including a plurality of reversilbe phase-modulating elements each comprising

an irregular ferroelectric crystal plate in which each set of mutually opposing end planes are normal to one of *a*-, *b*- and *c*-axis, and a thickness between said end planes is prescribed with respect to a difference Δn in the refractive index between light beams having a wavelength λ and having their polarization planes respectively parallel to said *a*- and *b*-axis within the crystal and to a positive integer P by

$$\frac{\lambda}{2 \cdot \Delta n}(P = \tfrac{1}{2}), \text{ and}$$

means for applying a voltage, sufficient to invert the spontaneous polarization of said irregular ferroelectric crystal plate by 180°, to said irregular ferroelectric crystal plate and in parallel to said *c*-axis,

said irregular ferroelectric crystal plates, which constitute the respective elements, being arranged on a plane normal to an incident linearly polarized beam so as to form a matrix among them, one of said *a*- and *b*-axis on said mutually opposing end planes of said each crystal plate being arranged in parallel to a polarization plane of said incident linearly polarized beam,

which is arranged in an optical path of one of the linearly polarized beams split by said beam splitter, and which has the split linearly polarized beam as the incident linearly polarized beam;

a Fourier transform lens which is arranged in said optical path of said linearly polarized split beam of said beam splitter, and on one side of said pattern generating device; a hologram recording medium which is arranged at a rear focal position of said Fourier transform lens; and

optical means which directs the other linearly polarized beam, split by said beam splitter, to said hologram recording medium at a predetermined angle,

whereby a hologram of a pattern image of said pattern generating device is prepared, comprising the steps of:

1. applying a voltage sufficient to invert spontaneous polarization by 180°, separately to reversible modulator elements of a bit group, generating a predetermined information pattern and to reversible modulator elements of a bit group, generating no pattern among said respective reversible phase-modulating elements which constitute said pattern generating device, said spontaneous polarization having random polarities among the respective bits;
2. focussing the pattern image of said pattern generating device, having undergone the above step (1), to said hologram medium;
3. thereafter, applying a voltage sufficient to invert by 180° the spontaneous polarization of said reverisble modulator elements of said bit group, generating no pattern, in the step (1); and
4. focussing the pattern image of said pattern generating device, having undergone the step (3), to said hologram recording medium having undergone the step (2).

3,924,925

FOCUSSED IMAGE HOLOGRAM PROJECTOR USING A LONG NARROW LIGHT SOURCE

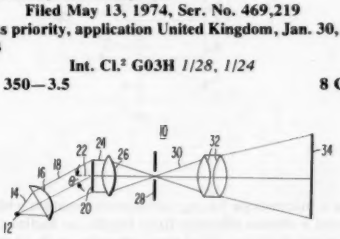
Michael Thomas Gale, Langnau am Albis, and David Greenaway, Basserdorf, both of Switzerland, assignors to RCA Corporation, New York, N.Y.

Filed May 13, 1974, Ser. No. 469,219

Claims priority, application United Kingdom, Jan. 30, 1974, 4226/74

Int. Cl.² G03H *1/28, 1/24*

U.S. Cl. 350—3.5 **8 Claims**



1. In a projector for displaying a color picture derived from a focussed image hologram situated in a given plane, said hologram being of the type comprising a plurality of plane parallel diffraction gratings each of said gratings having grating lines of a different constant spatial frequency being modulated in accordance with a different color component of said color picture to form a spatial carrier for that color component; said projector including first means for illuminating said hologram with an incident non-coherent light beam inclined at a predetermined angle with respect to the normal to said given plane, said non-coherent light beam having a spectrum which includes a spectral wavelength portion corresponding to each respective one of said different color components, and second means responsive only to first diffraction-order output light from said respective gratings for projecting said color picture on a viewing screen; the improvement therein:

a. wherein the lines of at least one of said gratings in said given plane is oriented substantially parallel to a given longitudinal axis none of said gratings in said given plane is oriented substantially perpendicular to said longitudinal axis,

b. wherein said first means includes a filamentary light source having a relatively long length dimension oriented substantially parallel to said longitudinal axis and relatively small cross-section dimensions oriented substantially normal to said longitudinal axis, and optical means responsive to light from said light source for deriving said non-coherent light beam with said predetermined angle lying in a plane substantially normal to said longitudinal axis,

c. wherein said second means includes a spatial filter having a narrow, longitudinal slit therein with the length of said slit being oriented along said longitudinal axis, and

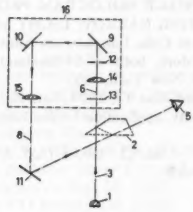
d. wherein said different predetermined spatial frequencies of each of said respective gratings is such as to direct through said slit only the spectral wavelength portion of first diffraction-order output light from that grating which corresponds to the color component of said picture carried by that grating.

3,924,926

POLARIZING ATTACHMENT FOR MICROSCOPES HAVING INCLINED BINOCULAR EYEPIECE

Kurt Merstallinger, and Klaus P. Schindl, both of Vienna, Austria, assignors to C. Reichert Optische Werke, AG, Vienna, Austria

Filed May 28, 1974, Ser. No. 473,593
Int. Cl.² G02B *7/88, 21/06, 21/20*
U.S. Cl. 350—34 **9 Claims**



1. In a microscope having an objective system with an exit pupil and a chosen effective focal length, an inclined binocular eyepiece having a focal plane therein, each of these elements being aligned along an observation axis, and a beam deflector alternately positionable on and off of said observation axis between said objective system and said eyepiece, the improvement comprising an alternate observation axis such that said objective system provides an intermediate object image plane on said alternate observation axis when said beam deflector is positioned off said observation axis, said intermediate object image plane being located at a distance from said objective system substantially equal optically to said effective focal length, said intermediate object image plane and said eyepiece focal plane being optically-spaced equidistant from said objective system, an optical modifying element positioned at said intermediate object image plane, a plurality of deflectors positioned on said alternate observation axis subsequent to said intermediate object image plane to direct said alternate observation axis from said intermediate object image plane toward said eyepiece, and a lens system aligned along said alternate observation axis after said intermediate object image planes to re-image said object in the eyepiece focal plane whereby polarized light from the objective system reaches said optical modifying element without being influenced by said plurality of deflectors.

3,924,927

CORE GLASS FOR FIBER OPTICS

Warren W. Wolf, Reynoldsburg, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Mar. 28, 1975, Ser. No. 563,022
Int. Cl.² C03C *3/04, 13/00;* **G02B** *5/16*
U.S. Cl. 350—96 B **9 Claims**

1. A bulk zinc alkali silicate glass composition having an index of refraction ranging from 1.545 to 1.560, suitable for use as fiber optics and consisting essentially by weight of:

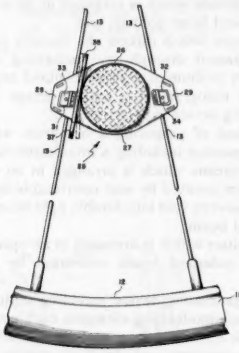
	Weight Percent
SiO_2	61 to 64
Al_2O_3	7 to 10
ZnO	15 to 24
Li_2O	7 to 11
Sb_2O_3	0 to 0.1.

3,924,928

ATTACHMENT FOR REFLECTORS FOR SPOKE WHEELS

Robert C. Trimble, 258 Main St., Northboro, Mass. 01532

Filed Mar. 12, 1975, Ser. No. 557,625
Int. Cl.² G02B *5/12;* **B60B** *11/00;* **B60R** *7/00*
U.S. Cl. 350—99 **10 Claims**



1. A safety device in combination with a wheel mounted reflector adapted to be carried by the spokes of a spoke wheel rotatably carried by and between two wheel supporting members, said device comprising:

a. a light reflective member having an opening to receive and engage a wheel reflector, said light reflecting member having a thickness and said opening being of a size that when said light reflecting member is carried by a wheel reflector attached to a spoke wheel, said light reflecting member engages and is substantially held against movement by said wheel reflector and at least one spoke.

3,924,929

RETRO-REFLECTIVE SHEET MATERIAL

Reynold E. Holmen, White Bear Lake, and Alfred H. Nellessen, Roseville, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

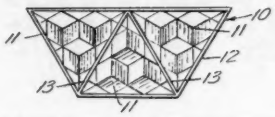
Continuation of Ser. No. 594,137, Nov. 14, 1966, abandoned.
This application Mar. 6, 1972, Ser. No. 232,023
Int. Cl.² G02B *5/12*
U.S. Cl. 350—103 **9 Claims**

1. A cellular reflector structure having a plurality of individual adjacent cells for providing improved vandal-resistant

reflectors, signs and legends having high retroreflectivity and good daytime color appearance, said reflector structure comprising a monolithic body of transparent material having

a light receiving front face having a smooth uninterrupted surface area extending over adjacent cells and

a rear face having a rear surface area immediately opposite and coextensive with said uninterrupted front surface area, said rear surface area having a plurality of intersecting septa visible from said front face defining and isolating a plurality of polygonal cells each from the other and having a plurality of cube-corner retroreflecting units each having a set of three mutually perpendicular facets, each said cell having an area not greater than about one



square inch and containing at least three of said cube-corner retroreflecting units and the combined area within said cells being not less than the combined area of said septa, said septa having continuous free edges positioned rearward of the front face at least as far as said cube-corner retroreflecting units, which free edges permit the structure to be affixed to a backing to hermetically seal the cells individually,

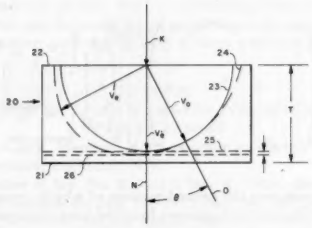
said cube-corner retroreflecting units being oriented in said cells to reflect light falling upon them through said front face back toward the source thereof to render said reflector structure highly visible at night and said septa improving the daytime appearance of the structure.

3,924,930

OPTICAL PARTIAL WAVE PLATE AND METHOD OF FABRICATING AND USING SAME

Donald R. Dewhirst, Torrance, and Alexander R. Muir, Playa Del Rey, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 29, 1974, Ser. No. 501,522
Int. Cl.² G02B 5/00
U.S. Cl. 350—157 **16 Claims**



1. In an optical partial wave plate formed from a birefringent crystalline material having a known optic axis direction and known indices of refraction in a manner such that said plate may be used for introducing a predetermined phase retardation, $\Delta\lambda_o$, between two components of a beam of polarized light of wavelength λ_o by passing said beam through said plate in a direction orthogonal to the surfaces of the entrance and exit windows thereof, the improvement comprising:

a. a slab of said birefringent material, said slab having two plane parallel opposed major surfaces the normal to each of which is directed at an acute angle of inclination θ to said direction of said optic axis in said material;

b. said slab also having a thickness T, measured perpendicularly between said two major surfaces which form said entrance and exit windows for said beam of light, which thickness T has a predetermined relationship to said angle of inclination, θ; and,

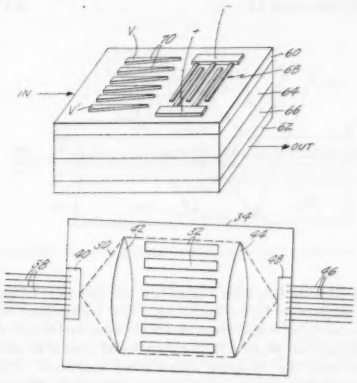
c. said predetermined relationship between said thickness, T, and said angle of inclination, θ, being given by the expression, $\Delta\lambda_o = (\eta_o - \eta_e)\sin^2\theta\, T$, where $\Delta\lambda_o$ is said predetermined phase retardation, η_o is the index of refraction for the ordinary ray in said material, η_e is the index of refraction for the extraordinary ray in said material for a direction of propagation perpendicular to said optic axis of said material, $\sin^2\theta$ is the square of the sine of said angle θ between said optic axis and said normal to said major plane surfaces, and T is said thickness, the value of $\sin^2\theta$ being such as to reduce the produce $(\eta_o - \eta_e)\sin^2\theta$ to permit the thickness T for a given desired value of $\Delta\lambda_o$ to have a value which not only produces the desired phase retardation but also is large enough to increase the strength of the plate.

3,924,931

INTEGRATED OPTICAL SIGNAL PROCESSING SYSTEM

Peter K. Cheo, West Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 446,579, Feb. 27, 1974. This application Apr. 1, 1974, Ser. No. 456,693
Int. Cl.² G02B 5/14
U.S. Cl. 350—160 R **20 Claims**



1. A thin film electrooptic switch comprising

an electrically conducting substrate,

a high resistivity thin film material fabricated on the surface of said substrate,

a plurality of flat, metallic electrodes located parallel to each other on the surface of said thin film material and spaced from each other across the width of said thin film material,

means for applying a selected voltage to selected ones of said electrodes to produce a potential difference between each of said selected electrodes and said substrate and thereby generate an intense electric field between each of said selected electrodes and said substrate, said electric field being oriented perpendicular to the plane of said thin film material and producing in said thin film material a spatial variation in the index of refraction thereof across the width of said thin film material,

means for coupling a coherent optical beam into said thin film material and causing said optical beam to propagate as a guided optical wave along an optical waveguide consisting of said thin film material and said substrate,

said wave front propagating substantially parallel to the direction of said electrodes and intersecting the portion of the thin film material containing the spatial variation in the index of refraction whereby a phase variation is produced in said optical beam and said beam is selectively deflected in the plane of said thin film material,

and means for coupling said deflected optical beam out of said thin film material.

20. A three dimensional switch comprising

a substrate of electrically conductive material,

first and second electrooptically active thin films fabricated on said substrate on opposite sides thereof,

means for coupling an electromagnetic wave into said first thin film,

electrode means for electrooptically producing a spatial variation in the index of refraction of said first thin film to produce a deflection of said wave in the plane of said thin film material,

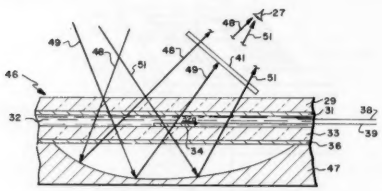
means for coupling said wave from said first thin film into said second thin film,

and means for coupling said deflected wave out of said second thin film.

3,924,932
LIQUID CRYSTAL DISPLAY UTILIZING REFLECTED LIGHT

Mititaka Yamamoto, Los Altos, Calif., assignor to Omron Corporation of America, Mountain View, Calif.

Filed Aug. 9, 1974, Ser. No. 496,193
Int. Cl.² G02F 1/13
U.S. Cl. 350—160 LC **4 Claims**

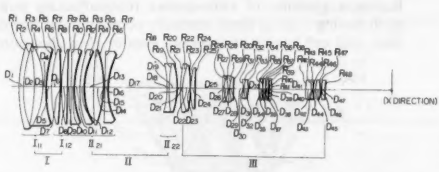


1. In combination with a liquid crystal assembly of the type having sequential layers including a first transparent support plate, a covering transparent electrode attached to one side of the first support plate, a field effect liquid crystal in electrical contact with the covering transparent electrode, a second transparent support plate adjacent to the field effect liquid crystal, a predetermined array of transparent electrodes attached to one side of the second transparent support plate in electrical communication with the field effect liquid crystal, and a first light polarizer attached to the other side of the second transparent support plate, a second polarizer inclined relative to the other side of the first transparent support plate, and a reflector in juxtaposition with the first polarizer, whereby ambient light incident on the first transparent support plate on the side of said second polarizer forming an acute angle therewith may pass through the liquid crystal assembly, impinge on said reflector, and pass back through the liquid crystal assembly to impinge on said second polarizer, so that ambient light energy loss due to reflected and absorbed energy is limited to that occurring during transmission of the ambient light energy through said first polarizer twice and said second polarizer once, whereby an observer positioned on the side of said second polarizer forming an obtuse angle with the first transparent support plate may observe greater light and dark contrast according to the polarization of the reflected light as determined by electric fields applied between the covering transparent and predetermined array of transparent electrodes.

3,924,933
ANAMORPHOTIC LENS SYSTEM

Ryusho Hirose, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Japan

Filed Nov. 15, 1973, Ser. No. 416,057
Claims priority, application Japan, Nov. 17, 1972, 47-115427
Int. Cl.² G02B 13/08
U.S. Cl. 350—181 **8 Claims**



1. An anamorphotic-type lens system in which a master lens is positioned in rear of a cylindrical lens, which system comprises an afocal spherical lens group for focussing, an afocal anamorphotic cylindrical lens group and a master lens group of the zoom type coaxially arranged in this order from the front, said spherical lens group and said enamorphotic cylindrical lens group each being divided into two parts and satisfying the following relationship in combination:

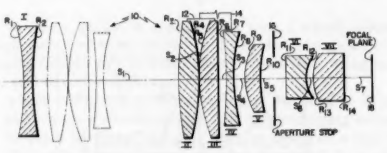
$$|f_2| - |f_1| = e \qquad f_{1'} < 0 \qquad f_{2'} - |f_{1'}| = e'$$

wherein f_1 is the focal length of the front part of the spherical lens group; f_2 is the focal length of the rear part of the spherical lens group; e is the distance between the principal points of the both parts; $f_{1'}$ is the focal length of the front divergent part of the cylindrical lens group; $f_{2'}$ is the focal length of the rear convergent part of the cylindrical lens group; and e' is the distance between the principal points of the both lens parts.

3,924,934
COMPACT SEVEN ELEMENT ZOOM LENS WITH MECHANICAL COMPENSATION

David S. Grey, Lexington, Mass., assignor to Polaroid Corp., Cambridge, Mass.

Filed Dec. 26, 1972, Ser. No. 318,225
Int. Cl. G02b 15/16
U.S. Cl. 350—184 **14 Claims**



1. A zoom lens the optical portion of which consists of, in an axially aligned arrangement from the long conjugate side to the short conjugate side:

a negative first lens component;

a positive second lens component;

a positive third lens component with unequally curved surfaces, having its more strongly curved surface toward said long conjugate, adjacent and rigidly connected to said positive second component;

a negative fourth lens component;

a positive meniscus fifth lens component curved toward said short conjugate;

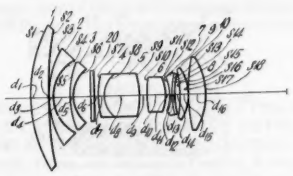
a negative sixth lens component, having a strong concave surface toward said short conjugate; and

a positive seventh lens component, having a strong convex surface toward said long conjugate.

3,924,935
LARGE APERTURE WIDE ANGLE LENS

Yasuo Takahashi, and Ryota Ogawa, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 28, 1974, Ser. No. 484,205
Claims priority, application Japan, July 2, 1973, 48-74646
Int. Cl.² G02B *11/34*
U.S. Cl. 350—214 **2 Claims**



1. A wide angle lens system including ten lenses consecutively successively designated from the front to the rear, the lens surfaces being consecutively successively designated, with cemented faces defining a single surface and a filter interposed between the third lens and the fourth lens, said lens system possessing the following dimensions and values:

$r_1 = 326.282$	$d_1 = 40.61$	$n_1 = 1.64000$	$\nu_1 = 60.2$
$r_2 = 949.626$	$d_2 = 0.49$		
$r_3 = 207.067$	$d_3 = 9.98$	$n_2 = 1.78950$	$\nu_2 = 44.2$
$r_4 = 88.291$	$d_4 = 38.62$		
$r_5 = 230.832$	$d_5 = 5.99$	$n_3 = 1.58913$	$\nu_3 = 61.1$
$r_6 = 80.421$	$d_6 = 50.89$		
Filter thickness	7.30		
$r_7 = 276.609$	$d_7 = 11.59$	$n_4 = 1.75700$	$\nu_4 = 47.9$
$r_8 = 60.873$	$d_8 = 78.01$	$n_5 = 1.74950$	$\nu_5 = 35.2$
$r_9 = -349.170$	$d_9 = 20.89$		
$r_{10} = 740.533$	$d_{10} = 39.45$	$n_6 = 1.65160$	$\nu_6 = 58.6$
$r_{11} = -100.524$	$d_{11} = 10.47$		
$r_{12} = -81.327$	$d_{12} = 4.97$	$n_7 = 1.80518$	$\nu_7 = 25.4$
$r_{13} = 228.884$	$d_{13} = 7.50$	$n_8 = 1.48749$	$\nu_8 = 70.1$
$r_{14} = 340.745$	$d_{14} = 9.88$		
$r_{15} = -409.070$	$d_{15} = 21.91$	$n_9 = 1.51633$	$\nu_9 = 64.1$
$r_{16} = -104.702$	$d_{16} = 0.49$		
$r_{17} = 598.995$	$d_{17} = 36.08$	$n_{10} = 1.77250$	$\nu_{10} = 49.6$
$r_{18} = -162.162$			

wherein rj is the radius of curvature of the jth lens surface, dj is the axial distance between the jth lens surface and the $(j+1)$th surface, n_i is the refractive index of the ith lens and νi is the Abbe number of the ith lens, the fourth and fifth lenses being cemented at their mating confronting faces to form a first doublet and the seventh and eighth lenses being cemented at their mating confronting faces to form a second doublet.

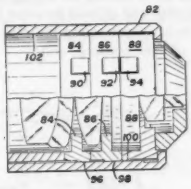
3,924,936
METHOD OF AND APPARATUS FOR ALIGNING OPTICAL LENSES

James A. Clark, Mendon, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Continuation of Ser. No. 883,213, Dec. 8, 1969, abandoned. This application July 20, 1973, Ser. No. 381,305
Int. Cl. G02b *7/02*
U.S. Cl. 350—252 **10 Claims**

1. A cell for carrying an optical element upon a seat, comprising:

a substantially cylindrical housing defining the seat for the optical element and having only two separate reference projections disposed about the periphery of the housing, each reference projection extending radially outward away from the seat and terminating at a curved surface of each projection comprising an outermost portion of the housing, each of which curved surfaces has a radius of curvature which is no greater than the radius of curvature of the cylindrical housing, to define an identifiable fixed reference point on each separate curved surface which separate points are respectively, disposed at that point along each of the outermost curved surfaces of the projections which is farthest from a centrally located axis

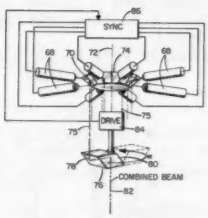


passing through the center of the seat for the optical element, the reference points being spaced equal distances from the centrally located axis along respective lines extending orthogonally to the axis.

3,924,937
METHOD AND APPARATUS FOR SEQUENTIALLY COMBINING PULSED BEAMS OF RADIATION

James L. Munroe, Nonantum, and Paul Gregory DeBaryshe, Lincoln, both of Mass., assignors to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed Jan. 30, 1974, Ser. No. 438,029
Int. Cl.² G02B *27/17*
U.S. Cl. 350—285 **39 Claims**



1. A system for combining beams of pulsed radiation comprising:

a plurality of pulsed radiation sources for providing spacially separate beams of radiation pulses in a sequence;

said radiation pulses having a finite time duration;

means for receiving the sequence of spacially separate beams of radiation pulses to direct said separate beams of radiation pulses along a generally common path;

said means for receiving said sequence of beams of radiation pulses to direct them along a generally common path being operative to direct the pulsed beams along said common path substantially without dynamic angular variation in the pulsed radiation beams throughout the finite duration of each rotation pulse.

3,924,938
REMOTELY CONTROLLED DAY-NIGHT OUTSIDE TRUCK MIRROR

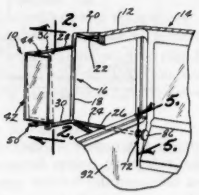
James W. Carson, 204 Center Ave. South, Mitchellville, Iowa 50169

Continuation-in-part of Ser. No. 266,230, June 26, 1972, Pat. No. 3,811,755. This application May 10, 1974, Ser. No. 468,678The portion of the term of this patent subsequent to May 21, 1991, has been disclaimed.
Int. Cl.² G02B *5/08, 17/00*
U.S. Cl. 350—302 **6 Claims**

1. A remotely controlled outside truck mirror comprising, an elongated vertically disposed mirror unit having a mirror and a housing,

said housing having an outwardly extending pin at one end, a mounting bracket assembly for attachment to the side of a truck cab, including upper and lower support arms, one of said arms having an elongated slot in which said pin at said one end of said housing is received,

connecting means connecting the other support arm to the other end of said housing, and



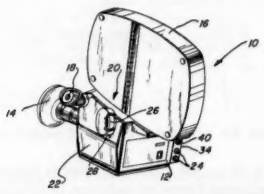
a control cable having one end positioning in a truck cab with the opposite end being connected to said outwardly extending pin thereby pivoting said mirror about a horizontal axis through said connecting means at the other end of said mirror unit as said pin at the one end moves back and forth in said slot in said one support arm.

3,924,939

PORTABLE SYNC-SOUND CAMERA WITH BUILT-IN SOUND-MONITORING SYSTEM

Dennis L. Scheminske, 3000 S. Madison St., Denver, Colo. 80210, and Russell L. Rayburn, 1055 Logan (Apt. 1304), Denver, Colo. 80203

Filed Nov. 25, 1974, Ser. No. 526,801
Int. Cl.² G03B *31/00*
U.S. Cl. 352—34 **2 Claims**



1. In a portable sync-sound camera of the type including a body housing sound recording and playback circuitry and an externally located viewfinder positioned in line with the operator's eye when the operator's head lies alongside said body, the improvement which comprises: an earphone-type speaker fastened to the same side of the camera body alongside which the operator's head lies when looking through the viewfinder, said speaker being electrically connected to the sound circuitry so as to monitor one or more sound inputs to the latter, and said speaker and viewfinder cooperating with one another such that when the operator has his head in position to visually monitor the subject being photographed through said viewfinder he will have an ear against said speaker in position to simultaneously monitor one or more of said sound inputs.

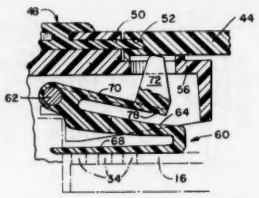
3,924,940

CASSETTE LIGHT SEAL FOR CAMERAS

Peter A. Scibilia, Westwood, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 2, 1974, Ser. No. 429,720
Int. Cl.² G03B *23/02*
U.S. Cl. 352—75 **12 Claims**

3. In a photographic camera having a body with a chamber to receive a multipurpose film cassette and a closure door movable between open and closed positions with respect to one side of the chamber to permit insertion and removal of the cassette when said door is open and operation of the camera to expose a cassette contained film strip when said door is closed, the cassette having a housing including an edge wall with an exposure opening therein and a side wall with an opening therein facing outwardly toward said one side of said chamber when the cassette is operatively positioned for exposure in said chamber, the improvement comprising independent means for light shielding the opening in the cassette side wall, said shielding means including a substantially opaque member and means on said camera body for supporting said member in a first position permitting substantially unobstructed insertion of the cassette into its operative position and in a second position biased against the cassette housing in covering relation to the opening of the cassette side wall so as to substantially light seal the opening in the cassette side wall during exposure operations.

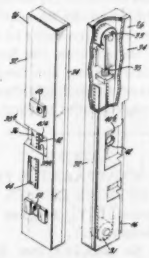


3,924,941

CASSETTE AND CASSETTE HOLDER FOR IMPROVED CONTROLLED-READING DEVICE

Elliott P. Smith, Wilmington, Del.; Robert H. Wachsmuth, Elkins Park, Pa., and Leonard Skolnick, Harwood, Md., assignors to McGraw-Hill, Inc., New York, N.Y.

Division of Ser. No. 323,968, Jan. 15, 1973, Pat. No. 3,862,799. This application Dec. 13, 1973, Ser. No. 424,286
Int. Cl.² G03B *23/02*
U.S. Cl. 352—78 R **9 Claims**



1. A film cassette for a continuous film loop without reel means comprising:

an elongated hollow housing of standardized fixed dimensions having at least projecting and driving apertures for projecting the film through the housing and for admitting drive means to the housing,

a continuous single taut loop of film within said housing having sprocket perforations for advancing the film longitudinally,

guide means within said holder including end guide means adjacent opposite ends of the elongated housing about which said film loop extends defining an elongated narrow loop path without the film contacting itself, including at least one movable guide means within said holder along

said path and further guide means intermediate said end guide means along said loop path positioned to gradually twist at least one run of said loop substantially 90° about its longitudinal axis so that the film is generally parallel to planes normal to the film in the rest of the loop as the film loop path passes the projecting and driving apertures, and back again into its initial plane beyond said apertures,

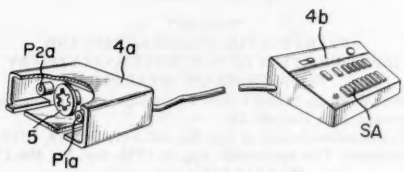
resilient tensioning means urging said movable guide means into said loop path in such direction as to render said loop taut and apply tension through the entire length of the continuous loop of film which tension facilitates cooperation with the drive and projection elements of a projector.

3,924,942

FILM PROJECTION SYSTEM HAVING ATTACHMENT DEVICE CAPABLE OF SWITCHING DIFFERENT SELECTED MODES OF PROJECTION

Tateo Yamada, Tokyo, and Masanori Uchidoi, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 6, 1974, Ser. No. 467,484
Claims priority, application Japan, May 8, 1973, 48-51469
Int. Cl.² G03B *23/04*
U.S. Cl. 353—25 **26 Claims**



1. A film projection system capable of random access projection comprising:

a film projection apparatus including slide film storage means for storing a plurality of slide films, and drive means for moving said slide film storage means along a predetermined path and for transporting the slide films in said slide film storage means to a slide film projectable position where a selected slide film is set for projection; and

an attachment unit attachable to and detachable from said projection apparatus, said attachment unit including random access operating means for controlling said drive means to project a desired one of said plurality of slide films, said random access operating means being located at a position in said attachment unit where at least one part of said operating means becomes mechanically linked with said drive means for controlling operation of said drive means when said attachment unit is attached to said film projection apparatus, said random access operating means comprising signal input entry means for entering a desired projection address signal for the random access, signal processing means for converting the entered projection address signal to corresponding movement of said one part of said operating means, signal holding means for holding the entered projection address signal for a predetermined time, and means for releasing said signal holding means from holding operation of the entered projection address signal;

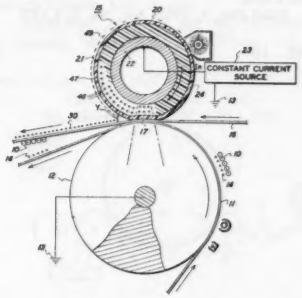
whereby random access projection can be performed when said attachment unit is coupled to said film projection apparatus.

3,924,943

SEGMENTED BIASED TRANSFER MEMBER

Gerald M. Fletcher, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed June 11, 1974, Ser. No. 478,184
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 R **10 Claims**



1. An improved transfer member for transferring an image from an image support surface to a copy moved between the transfer member and support surface, the improvement comprising:

at least two segments which are electrically discrete in a direction perpendicular to the direction of movement of the copy and

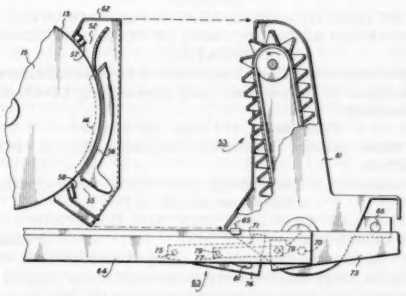
electrical bias means for supplying discrete electrical biases to at least two of the segments.

3,924,944

SPLIT DEVELOPER HOUSING

Richard E. Smith, Webster, and Herbert L. Bresnick, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 20, 1974, Ser. No. 525,532
Int. Cl.² G03G *15/08*
U.S. Cl. 355—3 DD **10 Claims**



1. A development system for developing latent electrostatic images carried by a substrate in an electrostatic processor: said system comprising a housing having a sump for storing a supply of developer; means for circulating developer along a path running from said sump, through a development zone, and then back into said sump; a stationary section mounted immediately adjacent said substrate to define said development zone; a movable section mounted for movement relative to said stationary section; and means for releasably securing said movable section to said stationary section; said movable

section including said sump, whereby said sump may be accessed without disturbing said development zone.

3,924,945

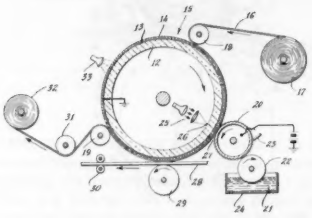
APPARATUS FOR INDUCTIVE IMAGING WITH SIMULTANEOUS POLAR INK DEVELOPMENT

John W. Weigl, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 3, 1974, Ser. No. 529,157

Int. Cl.² G03G *15/10*

U.S. Cl. 355—10 **3 Claims**



1. An electrostatographic imaging apparatus, comprising: a photoconductor assembly comprising a photoconductive material having a conductive, essentially transparent support base; means for uniformly frontally contacting said photoconductor assembly with a dielectric sheet; means for projecting a light and shadow image pattern through said support base of said photoconductor assembly to expose said photoconductive material; means for applying concurrently with exposure, a polar liquid developer to the surface of the region of the dielectric sheet which is in uniform contact with the exposed photoconductor assembly, said means being electrically biased with respect to said photoconductive assembly conductive support base, and having a patterned surface of raised and depressed portions such that the polar liquid developer is carried in the depressed portions with the raised portions being substantially free of the developer; and means for transferring said developer from said dielectric sheet to an image copy member.

3,924,946

METHOD OF AND APPARATUS FOR PRODUCING ENLARGED REPRODUCTIONS OF VESICULAR IMAGE NEGATIVES

Rudolf Meyer, and Erwin Ranz, both of Leverkusen, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed June 4, 1973, Ser. No. 366,287

Claims priority, application Germany, June 8, 1972, 2227854

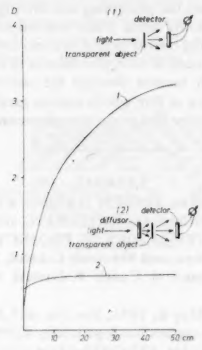
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² G03B *27/00;* **G03C** *5/04;* **G03B** *27/76*

U.S. Cl. 355—18 **2 Claims**

1. An enlarger for producing enlarged reproductions of a vesicular image negative comprising a light source capable of issuing a light beam, a condenser receiving the light beam, a vesicular image negative receiving and scattering the condensed light and an enlarging lens receiving the scattered light to form an enlarged reproduction of the image wherein the improvement comprises light scattering diffusion means positioned between the condenser and the image negative to determine the density of the reproduced image by the scattering power of the light scattering diffusion means.

2. The method of producing enlarged reproductions of a vesicular image negative, which comprises the steps of passing a light beam from a light source through a condenser, on to a vesicular image negative, passing the light scattered by the image negative through an enlarging lens to produce an enlarged image wherein the improvement comprises positioning between the vesicular image negative and the condenser a



diffuser member, producing diffused light, illuminating the vesicular image with said diffused light, and adjusting and controlling the density in the enlarged reproduction by inserting diffusers, having different diffusion characteristics.

3,924,947

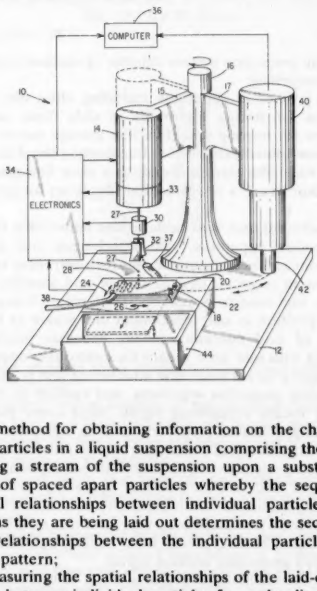
APPARATUS FOR PRESERVATION AND IDENTIFICATION OF PARTICLES ANALYZED BY FLOW-THROUGH APPARATUS

Walter R. Hogg, Miami Lakes, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Continuation-in-part of Ser. No. 407,811, Oct. 19, 1973, abandoned. This application Aug. 9, 1974, Ser. No. 496,178

Int. Cl.² G01N *33/16, 21/00*

U.S. Cl. 356—39 **54 Claims**



1. A method for obtaining information on the characteristics of particles in a liquid suspension comprising the steps of

A. laying a stream of the suspension upon a substrate in a pattern of spaced apart particles whereby the sequence of temporal relationships between individual particles of the stream as they are being laid out determines the sequence of spatial relationships between the individual particles in the laid-out pattern;

B. measuring the spatial relationships of the laid-out particles between individual particles for a plurality of particles to derive a first sequence of measurements;

C. measuring at least one characteristic of each particle in the stream before it reaches the substrate and the temporal relationship of that particle with at least one other individual particle prior to laying down of the particles for a plurality of particles to derive a second sequence of measurements including both those related to temporal relationships and those related to the characteristics of the individual particles; and

D. correlating the first sequence of measurements with the temporal relationships portion of the second sequence of measurements to identify a particular particle in the laid-out pattern with its at least one measured characteristic contained in said second sequence of measurements.

3,924,948

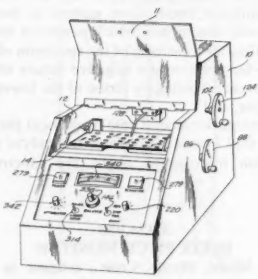
DENSITOMETER FOR USE IN QUANTITATIVE THIN LAYER CHROMATOGRAPHIC ANALYSIS

John Thoden, Vineland, and Theodore Wagner, Mantua, both of N.J., assignors to Kontes Glass Company, Vineland, N.J.

Filed Dec. 17, 1973, Ser. No. 425,513

Int. Cl.² G06K *9/08*; G01J *3/48*

U.S. Cl. 356—71 **35 Claims**



1. A densitometer for use in quantitative analysis of spots on a thin layer chromographic plate comprising a plate support, a head assembly positioned above said support, said assembly comprising a first source of light and means for sensing light from the plate, a second source of light situated below said support, said support having a frame portion for contacting the outer portion of the plate and an open portion aligned with the spotted areas of the plate such that the spotted areas of the plate may be exposed to light from said second light source.

21. A densitometer for use in quantitative analysis of spots on a thin layer chromographic plate comprising a plate support, a head assembly positioned above said support, a source of light and means for sensing light from the plate at least one of which is carried by said head assembly, said head assembly being movable between an operative position adjacent the plate and an inoperative position relatively remote from the plate, and means operatively connected between said power supply and said active portion of said head assembly for moving said active portion to said inoperative position when the densitometer power supply is turned off.

26. A densitometer for use in quantitative analysis of spots on a thin chromographic plate comprising a plate support, a head assembly positioned above said support, a source of light and means for sensing light from said plate at least one of which is carried by said assembly, means to move said head assembly and said support relative to each other to align the head assembly transversely with respect to the plate and to scan the plate longitudinally, and means operatively connected to said head assembly and movable adjacent said plate support for indicating the transverse location of the assembly relative to the plate, said means comprising a pointer mounted on said assembly and extending over the plate support.

35. The densitometer of claim **33** further comprising means for deactivating said sensing means except when said active portion of said head assembly is in said operational position.

3,924,949

SPECTROPHOTOMETER FOR USE AS A SPLIT BEAM AND DUAL WAVELENGTH MEASUREMENTS

Tadashi Honkawa, and Kenji Fukuda, both of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

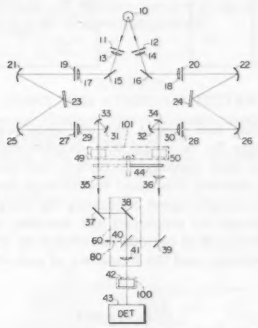
Filed Mar. 20, 1972, Ser. No. 235,925

Claims priority, application Japan, Mar. 19, 1971, 46-15126

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² G01N *21/00*; G01J *3/42*

U.S. Cl. 356—73 **7 Claims**



1. A spectrophotometer comprising a light source, optical means for directing the light beams from said light source along first and second paths, a pair of monochromators positioned along said first and second paths, respectively, for receiving the light beams from said optical means, a chopper for alternately interrupting the respective light beams in said first and second paths at the outputs of said monochromators, a first mirror block means separate from said chopper for receiving the interrupted light beams from said chopper and for directing a portion of the respective light beams in said first and second light paths into a common light path, a cuvette housing positioned at the output of said first mirror block means and through which said common light path extends, and detector means for receiving light from the output of said cuvette housing, said first mirror block means directing the remaining portion of respective light beams in said first and second light paths not directed into the common light path away from at least one of said cuvette housing and said detector means, whereby the presence of shielding means for interrupting the light beams is avoided and further including a second mirror block means interchangeable with said first mirror block means for separately deflecting and condensing the respective light beams in said first and second light paths from said chopper so as to direct the separate light beams onto said cuvette housing.

3,924,950

ATOMIC ABSORPTION SPECTROSCOPY WITH BACKGROUND CORRECTION

E. Horace Siegler, Jr., Darien, Conn., assignor to Perkin-Elmer Corporation, Norwalk, Conn.

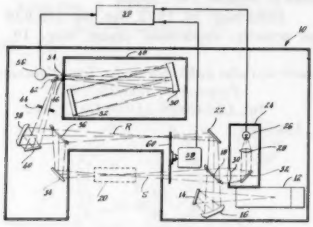
Filed Sept. 16, 1974, Ser. No. 506,267

Int. Cl.² G02J *3/36*, *3/42*

U.S. Cl. 356—82 **12 Claims**

1. An atomic absorption spectrometer which comprises: means for forming a first beam containing substantially monochromatic radiation comprising a wavelength of interest;

means for forming a second beam of pulsed nonmonochromatic radiation which includes said wavelength of interest; a first beam splitter for combining the radiation of said first and second beams, splitting the combined radiation into a sample beam and a reference beam and directing them, respectively, through a sample region and a reference region; means for chopping said sample and reference beams prior to



their entering said sample and reference regions; a second beam splitter for receiving and recombining said chopped beams after their leaving said sample and reference regions; means for isolating from said recombined beam a relatively narrow wavelength region containing the wavelength of interest; and means for measuring the intensity of said isolated wavelength region at periods established by the pulse rate of said second beam and the frequency of said chopping means.

3,924,951

APPARATUS FOR ILLUMINATING SMALL PARTICLES THAT ARE BEING COUNTED AND CHARACTERIZED

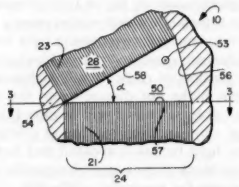
Wolfgang M. Dittrich, 44 Munster (Westf.), Am Krug 40, Germany

Continuation-in-part of Ser. No. 232,026, March 6, 1972, abandoned. This application May 9, 1973, Ser. No. 358,646

Claims priority, application Germany, Mar. 5, 1971, 2110675

Int. Cl.[2] G01N *15/02, 21/00, 1/00*

U.S. Cl. 356—102 **4 Claims**



2. Apparatus for illuminating small particles for counting and characterizing said particles comprising:

a tubular measuring chamber,

a dispersion current flowing through said chamber wherein water is the medium carrying said particles,

a first wall of said chamber comprising optical fibers which illuminate said chamber,

a second wall of said chamber having means for totally absorbing all light transmitted to it;

means for conducting said current through said measuring chamber; and

means optically coupled to said chamber for counting and evaluating light impulses produced therein.

3,924,952

ARRANGEMENT AND METHOD FOR STUDYING RADIATION BY INTERFERENTIAL SPECTROMETRY

Robert Gaston André Maréchal, Orsay, and Gerard Fortunato, Cachan, both of France, assignors to Etablissement Public: Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Feb. 6, 1974, Ser. No. 440,142

Claims priority, application France, Feb. 6, 1973, 73.04040

Int. Cl.[2] G01B *9/02*

U.S. Cl. 356—106 S **15 Claims**

1. An arrangement for studying the spectrum of a source, which comprises:

interferometer means for receiving light from said source and splitting it into two laterally spaced images having substantially equal intensities;

lens means for focusing light from said two images to provide a luminous interference pattern in the back focal plane of said lens means, which pattern is an exact, high contrast Fourier transform of the spectrum of said source obtained for positive and negative values of the optical path difference existing by virtue of the lateral spacing of said images; and

modifying means located at said back focal plane for operating on said Fourier transform to analyze said pattern and obtain information about the spectrum of said source.

3,924,953

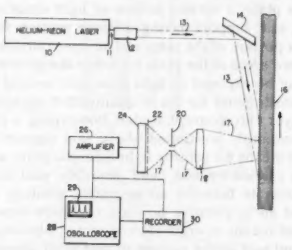
HELIX PITCH MONITOR

Frederick C. Allard, Mystic, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 18, 1974, Ser. No. 534,040

Int. Cl.[2] G01B *11/14*

U.S. Cl. 356—167 **11 Claims**



1. A pitch monitor for determining quality of spacing on a moving reflector having spaced reflective surfaces comprising: a source of electromagnetic energy adapted to generate and conduct a beam onto the moving reflector having spaced reflective surfaces for reflecting spatial highlights of said beam;

a lens aligned to receive the reflected portion of said beam for forming an image of the reflected spatial highlights of said beams;

stop means receiving said reflected portion of said beam for establishing telecentricity of said lens;

opaque means having spaced indicators aligned with said image of spatial highlights upon said reflective surfaces

being perfectly spaced for transmitting said image of spatial highlights in alignment with said indicators;

photodetection means for converting energy in said image of spatial highlights in alignment with said spaced indicators into an electrical signal; and

readout means connected to receive said electrical signal for providing an indication of the spacing of said reflective surfaces.

3,924,954
HELIOGRAPH

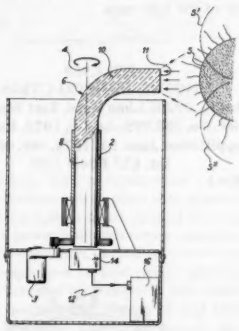
Jean-Claude Decret, Seyssinet-Pariset; Pierre Denis, and Paul Jourdan, both of Grenoble, all of France, assignors to Commissariat a l'Energie Atomique and Institut National de la Recherche Agronomique, both of Paris, France

Filed Apr. 16, 1974, Ser. No. 461,451

Claims priority, application France, Apr. 20, 1973, 73.14538

Int. Cl.² G01J 3/48

U.S. Cl. 356—188 **10 Claims**



1. A heliograph comprising:

a light guide having an axis parallel to the earth's axis and driven by means in a uniform movement of rotation about its axis at an angular velocity which is higher than the velocity of rotation of the earth on its own axis, the upper portion of said guide being elbowed with respect to the axis,

a stationary photodetector placed beneath the lower end of said guide and

electronic counter means for counting the electrical pulses delivered by said receiver.

3,924,955
SELF-RETAINING WASHER

Barry Roger Michael Barnett, and Arthur William Burton, both of West Drayton, England, assignors to TRW Inc., Cleveland, Ohio

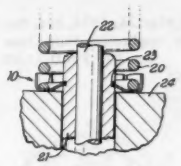
Filed July 17, 1974, Ser. No. 489,244

Claims priority, application United Kingdom, July 23, 1973, 35049/73

Int. Cl.² F16B 9/00

U.S. Cl. 403—230 **2 Claims**

1. A washer comprising a base portion divided by a plurality of radially extending slots into a plurality of radially arranged tongues having end edges which define the internal circumference of the washer, and an annular flange around the outer circumference of the base portion, the annular flange extending from the base portion at substantially right angles thereto and being divided by a plurality of slits each of which extends into a tongue of the base portion, each of the tongues having an end portion which is inclined away from the plane of the remainder of the tongue so as to extend outwardly therefrom in the same general direction as the flange, and the slots extending into the flange, the arrangement being such that the tongues can be moved radially outwardly to increase the



diameter of the internal circumference of the washer by expanding the flange and thereby opening each slit in the flange to draw the tongues radially outwardly.

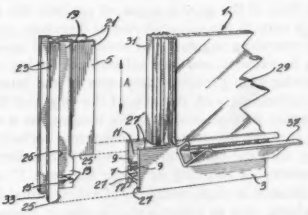
3,924,956
JOINT FOR WINDOW SHUTTER

Germain Fortier, Thetford Mines, Canada, assignor to Emile Fortier Inc., Thetford Mines, Canada

Filed July 1, 1974, Ser. No. 484,998

Int. Cl.² E04C 2/54

U.S. Cl. 403—231 **2 Claims**



1. A joint interconnecting the ends of two adjacent side members of a shutter movable in either of two opposite directions, one side member extending transversally of said directions and the other parallel to said directions, said joint being characterized by the following features:

a. the other side member is a metal shape having a solid elongated central web provided on either side with a pair of longitudinal flanges projecting from said web, the said pairs of flanges respectively defining an outer channel for the reception of a slide bar to guide said shutter and an inner channel; the flanges defining said inner channel terminating short of the end of said web to define transverse shoulders; the flanges defining said outer channel extending beyond said web; said web further having a transverse groove between said transverse shoulders and the end of said central web;

b. the one side member is a metal shape having two parallel side cheeks of which the outer faces fall respectively in the same parallel planes as the outer faces of the flanges of the other side member; said side cheeks having inwardly projecting strips and a bight extending parallel to said strips, the latter and said bight being located at constant distances respectively from the longitudinal edges of said side cheeks to define inner and outer channels,

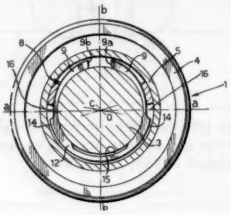
whereby the joint is achieved by inserting said strips of said cheeks into said grooves of said other side member, the inner edges of said cheeks then bearing against said shoulders of said other member.

3,924,957

LOCKING ARRANGEMENT FOR BEARING RINGS

Domenico Camosso, Turin, Italy, assignor to SKF Industrial Trading and Development Company B.V., Amsterdam, Netherlands

Filed May 24, 1974, Ser. No. 473,257
Claims priority, application Italy, June 4, 1973, 68646/73
Int. Cl.² F16D 15/00
U.S. Cl. 403—352 3 Claims



1. An arrangement for locking an annular bearing ring relative to a support comprising an intermediate element adapted to be forced between the bearing ring and the support, said bearing having a groove in the surface of said annular bearing cooperating with said support, said intermediate element being constituted by an elastic split ring located in said groove, said elastic split ring tapering in radial thickness from its free ends to define in cooperation with the cylindrical base surface of the groove a pair of cavities, the radial depth of which vary in the circumferential direction, each tapering section extending angularly for about 90° and being delimited radially by external and internal surfaces having non-concentric circular plan profiles, the center of the internal surface profile coinciding with the axis of the ring and the center of the external surface profile being located on a straight line passing through the center of the internal surface profile and forming, with the plane perpendicular to the diametral plane of symmetry of the ring an angle between 5° and 6°, and means located in each cavity for effecting radial deformation of the elastic ring to join the elastic ring in engagement with both the annular bearing ring and the support and thereby lock the bearing ring relative to the support, wherein the internal surface of the part of the elastic ring comprised between the two sections of tapering thickness has a central radial channel extending circumferentially and subtending at the centre of the ring an angle between 80° and 120°.

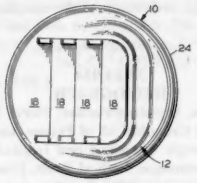
3,924,958

HIGHWAY RETROREFLECTING MARKER

William P. Rowland, Millbrook Lane, Southington, Conn. 06489, assignor to Rowland Development Corporation, Kensington, Conn.

Continuation-in-part of Ser. No. 317,263, Dec. 21, 1972, abandoned. This application May 7, 1973, Ser. No. 358,174
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² E01F 11/00
U.S. Cl. 404—15 17 Claims

1. A highway retroreflecting marker comprising; a housing having a base and a resiliently depressible cap projecting upwardly therefrom, at least said cap being formed from a relatively wear-resistant synthetic resin, said cap being substantially sealingly engaged with said base, and retroreflecting means supported in said housing, said cap having a redirecting means which is transparent to enable light rays to pass therethrough and which redirects the light rays striking said redirecting means to an angle of less than 30° to the perpendicular to the plane of said retroreflecting means, said housing being adapted for positioning of said base thereof and said cap thereof relative to a road surface so that light rays striking said redirecting means are redirected within said housing to said retroreflecting means, then are retroreflected from said retroreflecting means to said redirecting means, and thereafter are directed back from said redirecting means in the direction of the source of the light rays.

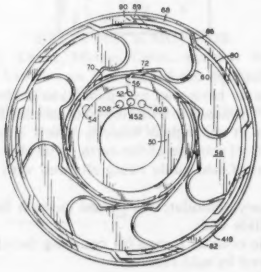


3,924,959

MOTOR CONSTRUCTION

Robert G. Bandy, 10206 Lima Road, Fort Wayne, Ind. 46808

Division of Ser. No. 385,995, Aug. 6, 1973, Pat. No. 3,861,819.
This application June 10, 1974, Ser. No. 477,694
Int. Cl.² F04D 1/00
U.S. Cl. 415—1 3 Claims



1. A method for effecting power actuation of a rotor comprising the steps of:

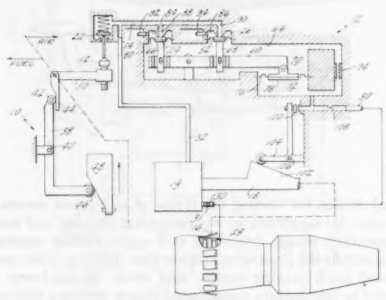
a. supplying a constant flow of air pressure to a relatively fixed annular member;

b. passing the compressed air in the inner annular member through radial passages of a rotor which moves relatively to the inner annular member to establish air connections for preselected periods in accordance with the angular position of said rotor, collecting the outflow of air from the rotor as such air is discharged through tangentially directed currents effecting circumferential thrust on said rotor and providing such outlet flow for preselected periods of circumferential movement of the rotor, redirecting the flow of air through said radially outer member and back through the rotor in a radially inner direction to effect additional circumferential thrust on the rotor by the outflow of air at the radially inner portion of said rotor, and recycling the air in radially inner and radially outer directions for at least one additional such cycle and thereafter venting such air.

3,924,960
COMPRESSOR BLEED SENSOR AND CONTROL FOR TURBINE TYPE POWER PLANTS

Kermit I. Harner, Windsor; William W. Hixson, Wethersfield; Michael A. Spadafora, Windsor, all of Conn., and Charles F. Stearns, Longmeadow, Mass., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 4, 1974, Ser. No. 457,955
Int. Cl.² F01B *17/00, 25/00*
U.S. Cl. 415—28 **5 Claims**



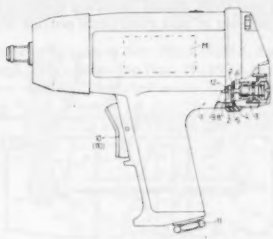
1. In combination with a steady-state compressor bleed system of a gas turbine power plant that schedules the bleed valves of said bleed system to an opened and closed position as a function of a power plant operating parameter for steady-state power plant operation, including a servo system having control means responsive to said power plant operating parameter, and an actuator responsive to said control means for effectuating the opening and closing of said bleed valves according to said schedule, overriding means, independent of said compressor bleed system, including another servo system also controlling said actuator, and means responsive to another power plant operating parameter for producing a signal indicative of an acceleration condition of said gas turbine power plant, and control means independent of said steady-state compressor bleed system operatively connected to said other servo system being responsive to said signal to further control said actuator whereby said bleed valves are opened and closed independent of said steady-state compressor bleed system, a first control valve disposed in said servo system for controlling servo fluid, a second control valve for controlling servo fluid in parallel flow relation with said first control valve disposed in said other servo system and means responsive to said other power plant operating parameter for producing a rate of change value thereof for controlling said second control valve independently of said first control valve.

3,924,961
PNEUMATIC TORQUEING TOOL

Johann Hess; Kurt Paule, both of Stuttgart; Kurt Latzina, Waldenbuch, and Richard Wolf, Stuttgart, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Dec. 5, 1974, Ser. No. 530,047
Claims priority, application Germany, Dec. 15, 1973, 2362458
Int. Cl.² F01D *17/06;* **B23B** *45/04*
U.S. Cl. 415—32 **7 Claims**

1. In a pneumatic torqueing tool, particularly a pneumatic wrench, a combination comprising a housing; a pneumatic motor in said housing and rotatable in a first direction and also in an opposite second direction; fluid conduit means, including a fluid passage for supplying pneumatic fluid to said motor when the same is to rotate in said first direction; and an adjustable throttle valve for controlling the flow of fluid through said passage, said throttle valve comprising a valve member having a valve member portion movable into and out of an orifice in said passage, first means mounting said valve member for gradual adjustment of the axial position of said valve member

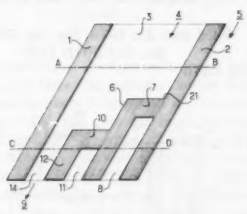


portion within said orifice to thereby vary the effective cross-section of the latter, and second means for rapidly withdrawing said valve member portion entirely from said orifice to thereby expose the maximum effective cross-section thereof.

3,924,962
MOLECULAR PUMPS OF THE DRUM TYPE

Louis Maurice, Paris, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Sept. 4, 1974, Ser. No. 503,126
Claims priority, application France, Sept. 14, 1973, 73.33097
Int. Cl.² F03D *5/00*
U.S. Cl. 415—90 **4 Claims**



1. In a high vacuum molecular pump comprising a cylindrical drum rotating with a slight clearance in a stator whose internal face is cylindrical, comprising several parallel helical, main grooves separated by low walls and cut in at least one of the opposite cylindrical faces, wherein; the improvement starting from a certain point, from the suction end to the discharge end, on the one hand the thickness of the low walls increases and on the other hand, grooves which are blind on the suction side and open on the discharge side are cut in the thickness of the low wall.

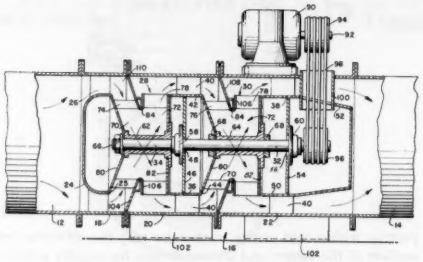
3,924,963
TURBOMACHINE

Dieter G. Zerrer, R.F.D. 5, Box 605, Easton, Md. 21601

Filed Sept. 27, 1973, Ser. No. 401,403
Int. Cl.² F04D *17/02*
U.S. Cl. 415—143 **16 Claims**

1. A pressure increasing turbomachine comprising a stationary housing having an elongated generally cylindrical chamber with a fluid flow intake at one end and a fluid flow discharge at the other end, a shaft, means for mounting said shaft for rotation within and concentric to the housing wall, said shaft adapted to be connected to a prime mover to impart rotation to the shaft, at least one fluid-dynamically integral runner including a centripetal inducer and a centrifugal impeller wheel portion, each portion comprising a plurality of circum-

ferentially spaced fluid flow energy increasing vanes within the vicinity of the periphery of said wheel portions and an intermediate shroud member separating the vanes of one portion from the other, means for mounting said runner for co-rotation on said shaft, means including stationary straightening vanes upstream of said centripetal portion for drawing



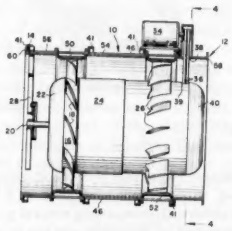
a fluid flow substantially without tangential velocity components radially into said centripetal inducer portion, and stationary means for guiding said flow from said centrifugal impeller portion axially through said housing, said stationary guide means including a plurality of stationary guide vanes arranged for substantially axial through-flow downstream of said centrifugal impeller portion.

3,924,964

AXIAL FLOW FAN APPARATUS

Ronald J. Lievens, Onalaska, and Richard W. Kabat, Genoa, both of Wis., assignors to The Trane Company, La Crosse, Wis.

Filed Dec. 23, 1974, Ser. No. 535,430
Int. Cl.[2] F01D *1/02*
U.S. Cl. 415—210 **8 Claims**



4. The axial flow fan as defined by claim **3** further including means for rigidly fastening said stator vanes at their radially outer ends to said second web and their radially inner ends to said core.

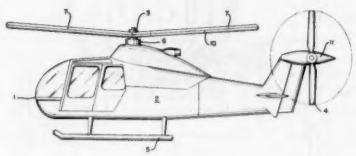
3,924,965

REVERSE VELOCITY ROTOR AND ROTORCRAFT

Harold E. Lemont, Arlington, Tex., assignor to Fairchild Industries, Inc., Germantown, Md.

Division of Ser. No. 325,444, Jan. 22, 1973, abandoned, which is a division of Ser. No. 85,717, Oct. 30, 1970, Pat. No. 3,729,272, which is a division of Ser. No. 700,469, Jan. 25, 1968, Pat. No. 3,554,662. This application Sept. 5, 1974, Ser. No. 503,333
Int. Cl.[2] B64C *27/74*
U.S. Cl. 416—114 **3 Claims**

1. A rotor system for high speed helicopters comprising a main rotor with rotor blades, power means for rotating said rotor, variable blade pitch control means for regulating the pitch of said blades, drive means operatively connected to and rotating with said rotor, cyclic motion means driven by said drive means, said cyclic motion means comprising variable throw crank means operatively connected to and driven by said drive means, said crank means being adapted to translate the rotational motion of said drive means to a preselected higher than one/rev reciprocal motion for each revolution of said rotor blades, throw control means connected to said



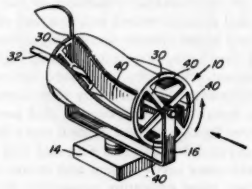
crank means for varying the throw of said crank means and thereby the amplitude of the reciprocal motion, and motion transmitting means driven by said cyclic motion means for transmitting the preselected higher than one/rev cyclic motion to said pitch varying means, said crank means being connected to said motion transmitting means whereby said reciprocal motion is communicated to said variable pitch control means.

3,924,966

WIND DRIVEN POWER GENERATOR

Robert J. Taminini, 4 Pinewood Road, Wyomissing, Pa. 19610

Filed Sept. 25, 1974, Ser. No. 509,349
Int. Cl.[2] F03D *1/06*
U.S. Cl. 416—177 **4 Claims**



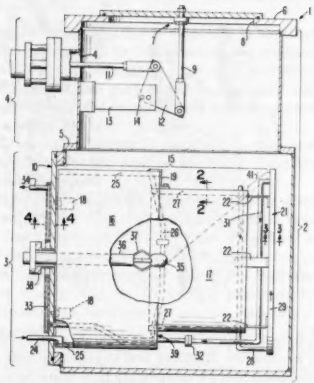
1. A wind rotor comprising an elongated cylindrical body of a length greater than its diameter, having a cylindrical side wall and open at its opposite ends and journaled for rotation about an axis generally coinciding with the center axis of said body, said body including a plurality of circumferentially spaced longitudinally extending slots similarly slightly inclined relative to radial planes passing through said slots, corresponding edge portions of said cylindrical side wall defining corresponding longitudinal edges of said slots including integral inwardly projecting substantially rectangular vanes inclined at least thirty degrees relative to planes tangent to said cylindrical side wall edges, the width of said vanes being substantially equal to the width of said slots and said vanes comprising inwardly deflected integral portions of said cylindrical side wall, the width of said vanes, from the base longitudinal edges thereof supported from said side wall to the remote free longitudinal edges thereof, being equal to at least one-half the radius of said body.

3,924,967

SUBLIMATION VACUUM PUMP HAVING A REMOVABLE GAS PERMEABLE CONDENSER

David J. Harra, Palo Alto, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Mar. 22, 1974, Ser. No. 453,739
Int. Cl.[2] F04B 37/02
U.S. Cl. 417—51 16 Claims



1. In a sublimation vacuum pump of the type wherein a getter material is sublimed onto a surrounding gas permeable cooled condensing structure for gettering gas from within the evacuable structure coupled in gas communication with said condenser, said sublimation pump including:

condenser means for surrounding a source of getter material which is to be sublimed in use, said condenser means having apertures therethrough arranged so that getter material emanating from the source of getter material will not have line-of-sight passage through said apertures to the outside of said condenser means, said apertures forming passageways for providing gas communication between the outside of said condenser means and the interior surfaces of said condenser means which face the source of sublimed getter material and which are to collect the sublimed material;

flange means coupled to said condenser means so as to form a unitary removable structure for sealing, in a gas tight manner, said condenser means to the evacuable structure to be pumped with said condenser means being disposed within the evacuable structure;

fluid cooling means for directing a stream of cooling fluid in heat exchanging relation with the getter condensing surfaces of said condenser means for cooling same in use; and

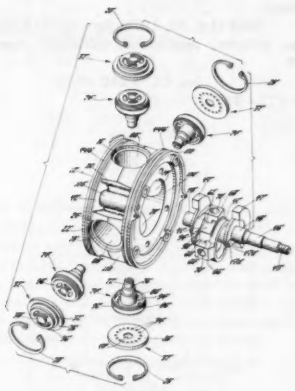
all portions of said condenser means which are in the path of line-of-sight trajectories from the source of getter material are carried by said flange means and removable therewith.

3,924,968

RADIAL COMPRESSOR WITH MUFFLED GAS CHAMBERS AND SHORT STABLE PISTON SKIRTS AND METHOD OF ASSEMBLING SAME

Marvin E. Gaines, and Robert L. Swadner, both of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 275,553, July 27, 1972, abandoned. This application Nov. 19, 1973, Ser. No. 416,933
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] F04B 1/04; B23P 15/00
U.S. Cl. 417—53 17 Claims



1. A radial compressor of the type including a cast cylinder housing having cross bores including cylinder walls therein along axes normal to each other, said housing having one closed end and a removable cylinder head closing its other end; a drive shaft rotatably mounted in said housing and said cylinder head; an eccentric on said drive shaft, a slider block rotatably mounted on said eccentric; a pair of yokes disposed normal to each other and in engagement with normal surfaces of said slider block; pairs of piston assemblies connected to each yoke so that the pistons extend oppositely from each other from said yokes; said piston assemblies being press-fit connected to said yokes providing a stable connection therebetween; said pistons including a relatively short piston skirt; said pistons further including an annular groove in said piston skirts extending a major portion of the width along said skirt; a sealing ring disposed in said groove substantially the full width thereof to provide a relatively wide bearing surface between said piston skirt and the cylinder walls of said cross bores, the relatively wide bearing surface of said sealing ring being sufficiently wide to accomplish a fluid tight seal while providing substantial area of engagement preventing metal-to-metal contact between said piston skirts and said cylinder walls; said cylinder housing being formed to include relatively large intake and discharge cavities muffling sound energy in gases flowing therethrough during operation of the compressor, said discharge cavities molded integral with said cylinder housing between the cylinder bores; reinforcing web portions molded integral with said cylinder housing and at least partially defining said discharge cavities and providing a rigid cylinder housing structure and areas for fastening the cylinder head to said cylinder housing as well as areas for securing the entire assembly in an operational environment, and valve means to direct fluids to and from the cylinder bores.

16. An improved method of assembling a radial compressor without screws comprising the steps of inserting a unitized drive shaft assembly including yoke sockets into the central intake chamber of a radially bored and counterbored drum-

shaped cylinder housing, press-fitting stems of unitized piston assemblies including intake valves through the radial bores into stable connections with the yoke sockets of said drive shaft assembly, snap-fastening unitized discharge valve assemblies into seated relationship in said counterbores radially outboard of said piston assemblies, and pressing a sleeve into surrounding relationship with said cylinder housing outboard of said discharge valve assemblies to form a discharge chamber around said cylinder housing.

3,924,969
HYDRAULIC SYSTEM

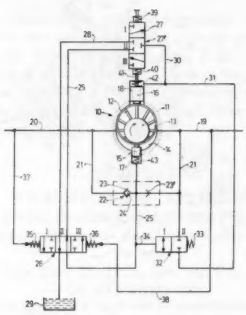
Werner Rometsch, Gerlingen, and Karl Veil, Uhingen, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Oct. 30, 1974, Ser. No. 519,101

Claims priority, application Germany, Nov. 14, 1973, 2356795

Int. Cl.² F04B *49/00*

U.S. Cl. 417—218 **6 Claims**



1. A hydraulic system, comprising a variable-flow fluid-handling machine having a high-pressure side and a low-pressure side and an adjusting member which is movable between a plurality of flow-adjusting positions; a larger and a smaller piston acting upon said member in mutually opposite directions, said smaller piston being connected in circuit with said high-pressure side; a multi-position servo-control unit to which said larger piston is mechanically connected so as to share the movements thereof, said unit connected in circuit with said machine and including a relief valve in circuit with said larger piston and said machine for controlling the flow of fluid from said high-pressure side when the fluid pressure exceeds a preset limit; and a control valve connected with said high-pressure side and said unit and operative at a pressure slightly below said preset limit for moving said unit to a position in which said unit connects said larger piston with said high-pressure side and interrupts communication of said larger piston with a low-pressure space.

3,924,970
ELECTRICALLY CONTROLLED FUEL PUMP

Ralph H. Johnston, and Leroy E. Lakey, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

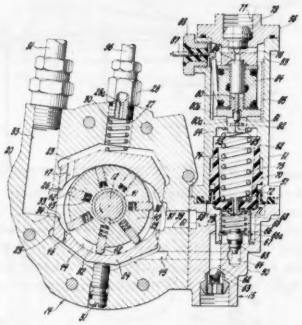
Filed Nov. 28, 1973, Ser. No. 419,481

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² F04B *49/00*

U.S. Cl. 417—220 **4 Claims**

1. In a fuel pump mechanism having a variable displacement pump for delivering fuel, said pump including a spring biased slider with a pump cavity therein slidable in a stator chamber of the pump housing for varying the displacement of the pump, a pressure regulator for controlling delivery of fuel from said pump comprising a housing defining a cavity divided by a diaphragm to provide a first chamber for receiving fuel discharged from said pump and a second chamber in communication with said first chamber by a sized orifice, said housing further defining a fuel delivery outlet extending from said first chamber for discharge of fuel and a regulating pressure outlet extending from said first chamber in communication with said stator chamber on the opposite side of said slider from said spring, said diaphragm being movable away from said regulating pressure outlet in response to an increase in fuel pressure within said first chamber, spring means biasing said diaphragm toward said regulating pressure outlet, a bracket secured to



said diaphragm within said first chamber, a valve member disposed in said first chamber and engageable with said regulating pressure outlet for controlling flow therethrough, means biasing said valve member away from said diaphragm toward engagement with said regulating pressure outlet, said valve member including means engageable with said bracket after said diaphragm and said bracket move a selected distance away from said regulating pressure outlet to thereby disengage said valve member from said regulating pressure outlet, a discharge orifice from said second chamber, and a solenoid operated pilot valve positioned to control the flow through said discharge orifice from said second chamber.

3,924,971
DEVICE FOR REGULATING THE SUPPLY OF PRESSURIZED FLUID OF TWO CIRCUIT SYSTEMS HAVING AT LEAST TWO PUMPS OF CONSTANT CUBIC CAPACITY

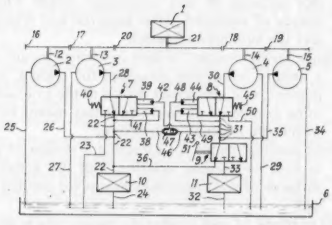
Jean Noel Jacquot, Saint Soupplets, France, assignor to Societe Anonyme: Poclain, Le Plessis-Belleville, France

Filed Jan. 23, 1975, Ser. No. 544,200

Claims priority, application France, Jan. 30, 1974, 74.03096

Int. Cl.² F04B *49/00*

U.S. Cl. 417—286 **4 Claims**

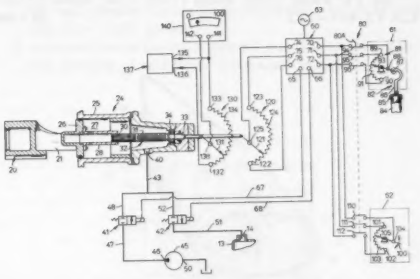


1. Device feeding two circuit systems with pressurised fluid, constituted by:

a fluid tank,
a first group of pumps each with constant flow,
a first of the two circuit systems,
a first feed conduit connecting a first pump belonging to the first group of pumps, to the first circuit system,
a first two-way distributor disposed in the first feed conduit ensuring, in its first position, the continuity of the first feed conduit and, in its second position, the communication of that part of the feed conduit included between the first pump and the first distributor with the tank,
a second group of pumps each with constant outflow,
the second of the two circuit systems,
a second feed conduit connecting a second pump belonging to the second group of pumps, to the second circuit system,
a second two-way distributor disposed in the second feed conduit ensuring, in its first position, the continuity of the second feed conduit and, in its second position, the communication of that part of the second feed conduit, included between the second pump and the second distributor with the tank,
a third two-way distributor disposed in the second feed conduit between the second distributor and the second circuit system and
a connecting conduit which connects the third distributor to that part of the first feed conduit included between the first distributor and the first circuit system, whilst the third distributor in its first position, establishes communication between the second distributor and the second circuit system and, in its second position, establishes communication between the second distributor and the connecting conduit and obturates that part of the second feed conduit connected directly to the second feed circuit, well as a first return member are coupled to the first distributor each of the first and second control members having an effect opposing that of the first return member, and said latter having an effect tending to place this first distributor in its first position, whilst third and fourth control members, as well as a second return member are coupled to the second distributor each of the third and fourth control members having an effect opposing that of the second return member, and said latter having an effect tending to place this second distributor in its first position, a first control conduit connecting that part of the first feed conduit, included between the first distributor and the first circuit system to the first control member, a second control conduit connecting that part of the second feed conduit included between the second distributor and the third distributor to the second control member, an auxiliary conduit connecting that part of the first feed conduit included between the first distributor and the first circuit system to that part of the second feed conduit included between the second and third distributors, a shuttle valve disposed in said auxiliary conduit, and a third control conduit connecting that part of the second feed conduit included between the second and third distributors to the third control member, and a fourth control conduit connecting the output of the shuttle valve to the fourth control member and finally the pumps of the first and second groups of pumps are coupled to a single drive motor, the maximum power of which is lower than the sum of the maximum powers of the various pumps.

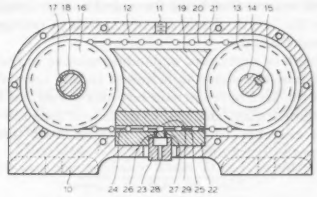
3,924,972
CONTROL MEANS FOR A VARIABLE CAPACITY ROTARY SCREW COMPRESSOR
Paul G. Szymaszek, Milwaukee, Wis., assignor to Vilter Manufacturing Corporation, Milwaukee, Wis.
Filed Oct. 29, 1974, Ser. No. 518,267
Int. Cl.[2] F04B *49/00*
U.S. Cl. 417—310 **15 Claims**

1. In combination: a variable capacity compressor having an adjustable control valve for regulating the capacity of said compressor; an actuator for adjusting said control valve; electro-responsive means for operating said actuator; control means for providing a control signal to establish an initial control valve adjustment, said control means including an automatic control unit and a manual control unit which are alternatively and selectively operable, said automatic control unit being responsive to a variable condition to provide a



control signal to regulate compressor capacity, said manual control unit being selectively operable to provide a control signal to maintain said control valve in a fixed position; feedback means operable in response to control valve adjustment to provide a feedback signal related thereto; and balancing means for receiving and comparing said control signal and said feedback signal and for providing an output signal related thereto to control said electro-responsive means.

3,924,973
METERING PUMP
Alden A. Lofquist, Jr., 10 Rita Way, Orinda, Calif. 94563
Continuation-in-part of Ser. No. 338,103, March 5, 1973. This application May 7, 1973, Ser. No. 357,682
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] F04B *19/14*; **F01D** *23/00*; **F03B** *9/00*
U.S. Cl. 417—320 **12 Claims**



1. Apparatus for metering small volumes of fluids which comprises:

A. Body means having an elongated passageway therein with said passageway having a smaller portion of smaller cross-sectional area, and a larger portion of larger cross-sectional area and a transitionary portion therebetween,
B. An endless member extending longitudinally through said passageway and movable longitudinally therethrough,
C. A plurality of annular portions attached to said endless member for movement therewith through said passageway with said annular portions being engagable with said passageway in fluid sealing relation in both said first and second portions,
D. First fluid flow means communicating with said passageway adjacent to said transitionary portion, and
E. Second fluid flow means communicating with the larger portion of the passageway.

3,924,974

FLUID EJECTION OR CONTROL DEVICE

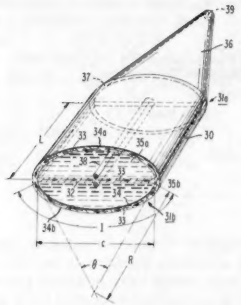
Kenneth Henry Fischbeck, Princeton, N.J., and Eric McPhail Leyton, deceased, late of Princeton, N.J. (by Sheila Leyton, executrix), assignors to RCA Corporation, New York, N.Y.

Filed Mar. 29, 1974, Ser. No. 456,162

Claims priority, application United Kingdom, May 21, 1973, 24140/73

Int. Cl.[2] F04B *17/00*; **B05B** *17/04*, *1/08*; **G01D** *15/18*

U.S. Cl. 417—322 **16 Claims**



1. The Combination comprising:

a first member, said first member having a cross-section having a bow-like shape;

a second member spanning said first member such that, in cross-section, said second member forms a chord of said bow-like shape;

said first and second members forming a tube-like chamber for fluid, said chamber including an output port for said fluid; and

means for coupling a control signal to said tube-like chamber,

said first member being formed of a first material such that the length of said bow-like shape contracts in response to said control signal,

said second member being formed of a second material such that the length of said chord expands in response to said control signal,

the length of said chord expanding relative to the length of said bow-like shape in response to said control signal so that the area between said bow-like shape and said chord is geometrically changed to thereby reduce the volume of said chamber whereby the flow of fluid through said output port is controlled.

3,924,975

FUEL PUMP

James M. Hundertmark, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

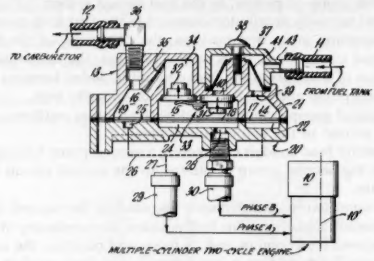
Filed Nov. 19, 1973, Ser. No. 416,832

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] F04B *43/06*

U.S. Cl. 417—395 **7 Claims**

1. A fuel pump for supplying fuel from a fuel source to the carburetor of a two-cycle internal-combustion engine having a plurality of cylinders, comprising first and second and third chambers, pressure-responsive diaphragm means extending across each of said chambers, a fuel-supply chamber having a fuel-source connection and having overlapping connection with said first and second chambers, an inlet check valve at the connection between said fuel-supply chamber and said second chamber, means including an outlet check valve connecting said second and third chambers, said third chamber including a fuel-output connection, first crankcase-connection means on the opposite side of the diaphragm at said first chamber for a first phase of pulsed operation thereof in accordance with a first-phase, second crankcase-connection means on the opposite side of the diaphragm at said second chamber



for pulsed operation thereof in accordance with a second phase in phase-displaced relation to said first phase, and third crankcase-connection means on the opposite side of the diaphragm at said third chamber for pulsed operation thereof in phase-displaced relation with said second phase.

3,924,976

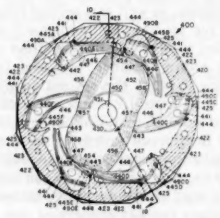
ENGINE

John N. Hinckley, Tree Top Apts., Apt. 111, 10522 Santa Gertrudes, Whittier, Calif. 90603

Division of Ser. No. 274,202, July 24, 1972, Pat. No. 3,824,044, which is a division of Ser. No. 860,684, Sept. 24, 1969, Pat. No. 3,684,413, which is a continuation-in-part of Ser. No. 812,656, April 3, 1969, abandoned. This application Nov. 30, 1973, Ser. No. 420,746

Int. Cl.[2] F01C *1/00*, *13/00*; **F04C** *13/00*

U.S. Cl. 418—8 **17 Claims**



1. A movable power arm for use in transmitting a torgue force to a rotor of a rotary engine contained within a sealed engine having substantial parallel housing side walls comprising:

an elongate arm section having front and rear ends, substantially parallel side portions and substantial transverse top and bottom walls, with said bottom wall adapted for receiving a power impulse from a working fluid within the engine housing and with said side portions adapted to slide in close proximity to said housing side walls;

connecting means intermediate said ends of said arm section for pivotally mounting said section in the engine housing adjacent the rotor and permitting said arm to swing inwardly against said rotor from an outward position adjacent said housing;

a contact surface defined adjacent said front end of said arm section for engaging with and transmitting a torque force to the rotor;

a sliding valve portion defined by the side portions adjacent said rear end of sadi arm section and having a predetermined configuration extending a substantial distance rearwardly of said connecting means and adapted to open and close exhaust port means in the adjacent portion of

the engine housing side wall in response to swinging movement of said arm section about said connection means with said valve portions closing said exhaust port means when said arms are in said outward position; and sealing means providing along said side portions of said arm section for sealing with the engine housing to thereby prevent the flow of working fluid past said arm section within said housing.

3,924,977

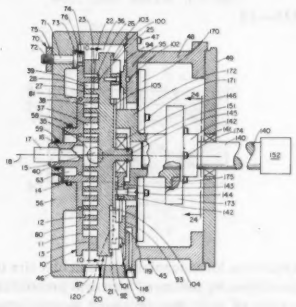
POSITIVE FLUID DISPLACEMENT APPARATUS

John E. McCullough, Carlisle, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 368,907, June 11, 1973. This application Oct. 23, 1973, Ser. No. 408,912

Int. Cl.² F04C *1/02*

U.S. Cl. 418—55 **48 Claims**



1. In a positive fluid displacement apparatus into which a fluid is introduced through an inlet port for circulation therethrough and subsequently withdrawn through a discharge port, in which two scroll members being maintained at a desired angular relationship and having wraps which make a plurality of moving line contacts to seal off and define at least one moving pocket of variable volume and zones of different fluid pressure when one of said scroll members is driven by driving means to orbit within said other of said scroll members while maintaining a fixed angular relationship therewith, and wherein said driving means associated with said one of said scroll members includes means to provide a centripetal radial force adapted to oppose a fraction of the centrifugal force acting upon said one of said scroll members, the improvement comprising radially compliant mechanical linking means between said driving means and said one of said scroll members, said radially compliant mechanical linking means including said means to provide said centripetal radial force of a magnitude to control the radial sealing force between said scroll members at a level to minimize both wear and internal fluid leakage.

3,924,978

COUPLING MEANS FOR A SECTIONAL DRIVE SHAFT OF A ROTARY MECHANISM

Robert William Loyd, Jr., Wyckoff, and Raymond P. Wallace, Montclair, both of N.J., assignors to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Continuation of Ser. No. 434,824, Jan. 18, 1974, abandoned. This application Sept. 26, 1974, Ser. No. 509,397

Int. Cl.² F01C *1/02*; **F02B** *53/00*; **F16B** *2/14*, *7/00*

U.S. Cl. 418—60 **5 Claims**

1. In a rotary piston mechanism having modular units and at least one split intermediate housing section, a multi-sectional drive shaft comprising

a. a drive shaft section for each unit;

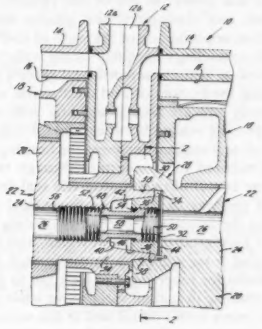
b. passageway means extending longitudinally through each of said drive shaft sections and in registry with each other;

c. means for connecting adjacent drive shaft sections in torque transmitting relationship adjacent each of the abutting surfaces of the split intermediate housing section comprising:

1. one drive shaft section having a coaxial annular first recess in one end portion;

2. the adjacent other drive shaft section having a cylindrical end portion receivable in the annular recess of said one drive shaft section;

3. a second recess having a tapered, annular surface in the end portion of said other drive shaft section;



4. force means separate from said drive shaft sections and having a peripheral surface of substantial complementary taper to the tapered surface of said second recess being disposed within said second recess;

5. actuating means accessible from outside the rotary mechanism through said passageway means for axially moving said force means relative to said second recess so as to exert radially outwardly directed forces on said one drive shaft section to expand the latter without axial movement of the drive shaft sections relative to each other and thereby maintain said drive shaft sections in tight abutting relationship for torque transmission.

3,924,979

ROTARY ENGINE ANTI-SPIN OIL SEAL

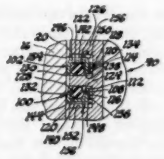
Dale P. Rose, Howell, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 13, 1973, Ser. No. 424,572

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² F01C *19/00*; **F04C** *15/00*, *27/00*

U.S. Cl. 418—142 **4 Claims**



1. A rotary engine having a housing with an inwardly facing peripheral wall and oppositely facing inner side walls cooperatively defining a cavity, a crankshaft rotatably supported in said housing, said crankshaft having an eccentric located in

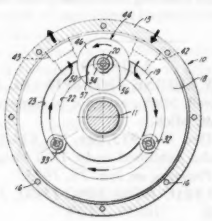
said cavity, a rotor rotatably mounted on said eccentric in said cavity, said rotor having sides facing said side walls and peripheral faces facing said peripheral wall defining a plurality of chambers that are spaced about and move with said rotor while varying in volume as said rotor rotates, a circular oil seal groove in each side of said rotor with its center on the rotor axis, a circular oil seal in each said oil seal groove axially movable to sealingly engage the opposing side wall, said oil seal having a backside and oppositely radially facing sides, said oil seal groove having a bottom and oppositely radially facing walls, a wave spring mounted in said oil seal groove engaging said groove bottom and said oil seal backside for biasing said oil seal to normally move axially in said oil seal groove to sealingly engage the opposite housing side wall, an elastomeric seal groove in one of said radially facing sides of said oil seal, said elastomeric seal groove having a radially facing bottom opposite one of the walls of said oil seal groove and radially extending oppositely facing walls, an elastomeric seal mounted in said elastomeric seal groove in said oil seal and engaging the bottom of said elastomeric seal groove and the oppositely radially facing said one wall of said oil seal groove to provide sealing between said oil seal and said rotor while said oil seal sealingly engages the housing side wall, lock tab means secured in an aperture through the bottom and adjacent one corner of said elastomeric seal groove in said oil seal out of the way of said elastomeric seal and projecting radially past the unsealed other radially facing side of said oil seal, and a lock groove in the unsealed wall of said oil seal groove in said rotor aligned with the normal direction of oil seal movement for receiving said lock tab to prevent said oil seal from spinning in said oil seal groove while permitting said lock tab to move with said oil seal in the normal direction in said oil seal groove so that said oil seal remains free to move axially to maintain sealing engagement with the opposite housing side wall.

3,924,980

LOW FRICTION, CONTROLLED LEAKAGE ROTARY ENGINE

James F. Gordon, Saratoga, Calif., assignor to Gordon Torquer, Ltd., Concord, Calif.

Filed Aug. 1, 1974, Ser. No. 493,720
Int. Cl.[2] F01C *1/08*
U.S. Cl. 418—191 **14 Claims**



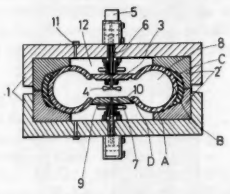
1. A rotary engine comprising the combination of a housing formed with a circular chamber concentric with a first longitudinal axis, means forming inlet and outlet ports in the housing for directing a working fluid into and from the chamber, a piston support member mounted within the housing for rotation about the first axis and with one side of the chamber being exposed to the support member, three circumferentially spaced-apart pistons carried by the support member, each piston projecting longitudinally from the support member into the chamber and being spaced from the chamber walls with a frictionless clearance through which fluid is directed to the volume ahead of the pressure-active piston which is exposed to the inlet port whereby the pressure differential across such piston is insubstantial for minimizing further fluid leakage past said frictionless clearance, a blocking valve positioned across the chamber between said inlet and outlet ports, said valve being mounted for rotation about a second axis parallel with said first axis, said valve being formed with a recess of a size sufficient to substantially envelope the pistons, and means for rotating the valve about the second axis in timed relationship with rotation of the support member whereby the pistons carried thereby move through the recess in the valve while the latter blocks substantial communication of fluid therethrough between the inlet and outlet ports.

3,924,981

APPARATUS FOR VULCANIZATION-PRESSING OF VEHICULAR TIRE TREADS

Kazumasa Sarumaru, Ashiya, Japan, assignor to Kobe Machinery Company, Ltd., Kobe, Japan

Division of Ser. No. 350,926, April 13, 1973. This application Jan. 31, 1975, Ser. No. 545,907
Claims priority, application Japan, Apr. 19, 1972, 47-39371
Int. Cl.[2] B29H *5/02, 5/04*
U.S. Cl. 425—24 **1 Claim**



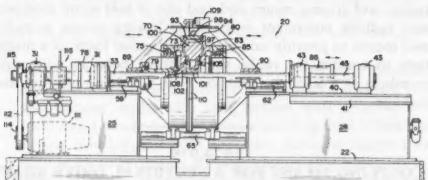
1. An Apparatus for vulcanizing a vehicular tire tread within the interior of tires by means of heat and pressurized air comprising: a pair of split tire receiving matrix segments into which a tire with an unvulcanized tread provisionally adhered to the outer periphery of a tire casing is inserted, an air intake channel through which said pressurized air is introduced into said segments, a heat source and a fan for circulating said air, both being located within a hermetically cooled space formed by closing said matrix segments including the inner wall of said tire casing.

3,924,982

CENTRIFUGAL TIRE CASTING MACHINE

James H. C. Yang, Cleveland, and Heinz W. Beneze, Akron, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Feb. 18, 1975, Ser. No. 550,806
Int. Cl.[2] B29H *5/02, 17/00*; B29F *1/00*; B29C *5/04*
U.S. Cl. 425—35 **15 Claims**



4. A centrifugal tire casting machine including in combination a rotatable drive shaft, a rotatable idler shaft in axial alignment with said drive shaft, a core member having an axial opening therethrough, means for axially moving at least one of said drive and idler shafts toward and away from the other so as to extend through the axial opening in said core member and into engagement with the other of said drive and idler shafts to rotatably support said core member, a first and a second mold half located on opposite sides of said core mem-

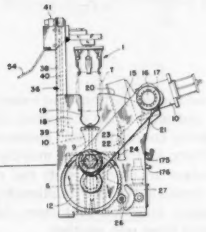
ber and each adapted to move inwardly and outwardly between open and closed positions, said first and second mold halves in closed position being in rotative driving engagement with said core member and, also, defining a tire cavity in combination therewith, drive means extendable between said drive shaft and said core member for rotatively driving said core member, and means for moving said first and second mold halves between open and closed positions.

3,924,983

GREEN TIRE LOADER

Dale S. Barton, Columbiana, and Stephen P. Yendrich, Jr., Beloit, both of Ohio, assignors to NRM Corporation, Akron, Ohio

Filed Nov. 14, 1974, Ser. No. 523,563
Int. Cl.[2] B29H *5/02*
U.S. Cl. 425—38 **29 Claims**



1. A loader for a tire press comprising two upstanding parallel tracks, an elevator frame mounted on and extending between said tracks for vertical movement therealong, said elevator frame including side plates guided by said tracks with a horizontal frame member extending therebetween, a chuck frame supporting at least one tire chuck, means supporting said chuck frame on said elevator frame for horizontal movement, and drive means interconnecting said elevator frame and chuck frame to move the chuck frame horizontally relative to said elevator frame.

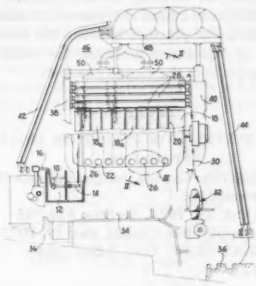
3,924,984

MACHINE FOR CONTINUOUSLY SPINNING AND TREATING RAYON-VISCOSE FILAMENTS AND YARNS

Valeriano Giacobazzi, Milan, Italy, assignor to Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A., Italy

Filed Mar. 22, 1974, Ser. No. 453,721
Claims priority, application Italy, Apr. 6, 1973, 22669/73
Int. Cl.[2] D01D *9/08*
U.S. Cl. 425—68 **3 Claims**

1. In a machine for the continuous spinning and treatment of viscose rayon filaments and yarns of the type including, in a structurally and operatively unitary assembly, a unitary supporting structure, coagulating bath means, spinning means for extruding filaments into the coagulating bath means, stretching means operable to stretch the coagulated filaments, and progressing means for progressively advancing the stretched filaments along the spiral-like path through a sequence of zones individually designed for sequential treating and washing of the filaments, with the progressing means including a rotary drum and the zones being axially juxtaposed along the rotary drum, and drying means operable to dry the filaments and produce a completely treated yarn; the improvement comprising, in combination, a ventilated casing enclosing said structurally and operatively unitary assembly to physically separate the treatment space therein, wherein gases, vapors and harmful substances are evolved, from the exterior environment in which operating personnel may be stationed during regular operation of said machine; yarn-collecting and winding means operable to collect and wind the treated and dried yarns produced by said machine, said yarn-collecting and winding means being also located within the ventilating casing and thus physically separated from the exterior environment; and respective liquid removing means located along



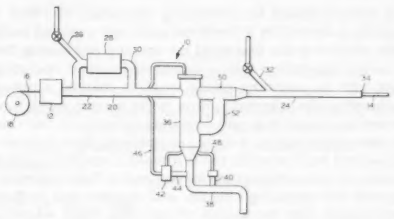
said spiral-like path between adjacent zones and operable to exert, on the yarn leaving the immediately preceding zone, a mechanical action for at least partially removing the liquids fed to the yarn in such immediately-preceeding zone before the yarn enters the immediately-following zone.

3,924,985

APPARATUS FOR MAINTAINING A PRESSURIZED LIQUID-GAS INTERFACE WITHIN A CONDUIT

Joseph Elwood Betts, Westport; William Michael Ott, Jr., and Howard Thomas Vaum, both of Trumbull, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,669
Int. Cl.[2] B29C *25/00*
U.S. Cl. 425—72 **9 Claims**



1. Apparatus for establishing and fixing a liquid-gas interface within a substantially horizontal conduit, comprising:

a. an elongated substantially horizontal conduit having a gas section connected with a source of gas under pressure and an adjoining liquid section connected with a source of liquid under pressure whereby both the gas and liquid are motivated by the pressure of their source to extend through the conduit counter to each other;

b. a closed chamber interposed into the substantially horizontal conduit at approximately the location of the liquid-gas interface to be established and fixed between the pressurized gas and liquid section of the conduit and connected in direct fluid communication with each of said sections, said closed chamber extending downward from the level of the substantially horizontal conduit for a substantial distance to provide a gravity feeding liquid reservoir chamber depending therefrom;

c. a drain outlet connected with a lower portion of the closed chamber and a drain valve located in said drain

outlet for controlling the discharge of liquid from the closed chamber; and

d. a pressure sensing regulator operating the drain valve and having pressure monitoring means responding to the pressure of the gas in the gas section of the conduit and the combined pressure of the gas with the pressure attributable to the weight of the liquid head contained within the closed chamber whereby the accumulation of liquid within the interposed closed chamber overcomes a predetermined balance of pressure between the source of gas and source of liquid and activates the drain valve to discharge liquid from the closed chamber.

3,924,986

CONTROL SYSTEM FOR INJECTION MOLDING APPARATUS

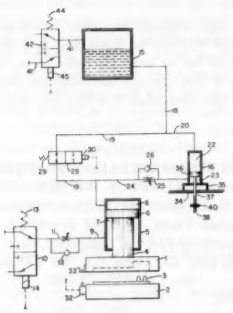
Ladislav Suler, Belleville, Canada, assignor to Bata Shoe Company, Inc., Belcamp, Md.

Filed Oct. 29, 1974, Ser. No. 518,795

Claims priority, application Canada, Oct. 29, 1973, 184459

Int. Cl.² B29C *1/00;* **B29H** *7/08*

U.S. Cl. 425—451.2 **2 Claims**



1. A control system for a molding apparatus, in which a mold cavity is formed by a first fixed mold and a second mold movable relative to the first mold for opening and closing the mold cavity, the control system comprising a mold operating cylinder with an operating piston movable therein; a piston rod connecting the operating piston to the second mold; supply means for connecting said operating cylinder on one side of the operating piston to a source of operating fluid for moving the second mold towards the first mold; a control cylinder with a control piston therein having one end in fluid communication with the operating cylinder and another end in fluid communication with the source of operating fluid, whereby the control piston moves in unison with the operating piston; a valve in said supply means for preventing the return of fluid to the reservoir from the operating cylinder when the second mold and operating piston are moving towards the first mold; and an adjustable stop means connected to the control piston for directly limiting movement thereof and consequently of the operating piston and the second mold away from the first mold.

3,924,987

ARTICULATED MOLD OPENING AND CLOSING MEANS FOR USE IN BLOW MOLDING APPARATUS

Gottfried Mehnert, Messelstr. 25, Berlin 33, Germany

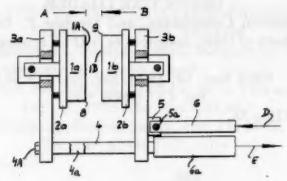
Filed Nov. 30, 1973, Ser. No. 420,707

Claims priority, application Germany, Dec. 7, 1972, 7244857

Int. Cl.² B29F *3/00;* **B29C** *1/16*

U.S. Cl. 425—451.5 **15 Claims**

1. An open-and-shut mold, particularly for use in blow-molding machines, comprising two upright closing members each having an upper portion, a lower portion, and an opening; substantially horizontally oriented parallel tie rods extending between said lower portions, at least one of said lower portions being movable together with and lengthwise of said tie rods; two mold sections having open sides facing each other; means articulately connecting each of said mold sections to said upper portion of one of said closing members in vertically spaced relationship to said tie rods, including elements rigid with said mold sections and extending with clearance through the openings of the respective closing members, and pivots articulately connecting said elements to the respective closing members; and means for moving at least one of said closing members to thereby shift the respective mold sections in said vertically spaced relationship between first and second positions in which said open sides respectively abut and are spaced from one another.



3,924,988

HOLLOW FILAMENT SPINNERET

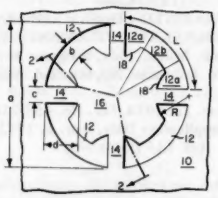
James Dwight Hodge, Greenville, N.C., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed May 24, 1972, Ser. No. 256,334

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² D01d *3/00*

U.S. Cl. 425—461 **5 Claims**



1. In a spinneret plate provided with at least one nozzle, for melt spinning filaments from molten polymers, said nozzle being defined by a substantially symmetrical pattern of four arcuate end-to-end slots interrupted by webs, said nozzle forming a filament having a single hollow core the improvement comprising, said slots having ends bearing inner inwardly-tapered enlargements at the outer one-third portions thereof, adjacent ends having proximate sides straight and parallel throughout their entire lengths, said slots having outer boundaries, said outer boundaries being the arc of a circle, the inner one-third portion of said slot being of substantially uniform width, the ratio of the distance c between adjacent slots and the width b of the slots being less than unity, said single hollow core being relatively smooth.

3,924,989

MACHINE FOR PRODUCING MOLDINGS FROM CHEMICAL COMPONENTS WHICH REACT QUICKLY WITH ONE ANOTHER

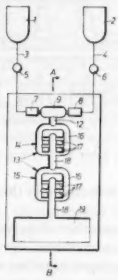
Ferdinand Althausen, Neuenkirchen-Seelscheid; Heinrich Boden, Opladen; Heinz Ersfeld, Bergisch-Neukirchen; Lothar Klier, Opladen; Reiner Raffel, St. Augustin, and Walter Schneider, Bensberg, all of Germany, assignors to Bayer Aktiengesellschaft and Maschinenfabrik Hennecke GmbH, both of Leverkusen Bayerwerk, Germany

Filed Oct. 18, 1973, Ser. No. 407,754

Claims priority, application Germany, Oct. 25, 1972, 2252201

Int. Cl.² B29D *27/04*

U.S. Cl. 425—130 **12 Claims**



6. An apparatus for producing moldings from chemical components which react quickly with one another, comprising a mold having an associated mixing chamber for reaction components which, at its outlet end, communicates with a cavity in said mold, means for introducing the said chemical components into the mixing chamber and a remixing system arranged between the mixing chamber and the mold cavity and adapted to homogenize the reaction mixture; said remixing system comprising a distributing channel with which a collecting channel is associated disposed in each half of the mold, and more than one mixing channel extending from each distributing channel to its associated collecting channel, the mixing channels of each mold half being so arranged that they cross over the mixing channels of the other mold half and being so constructed that any one mixing channel has a lesser cross-section than that of either its associated distributing or collecting channel; the assembly being so constructed that the dividing plane dividing the mold into halves extends through the mixing chamber and the remixing system.

3,924,990

COEXTRUSION APPARATUS

Walter J. Schrenk, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 183,786, Sept. 27, 1971, abandoned. This application Jan. 18, 1973, Ser. No. 324,739

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² B29F *3/12*

U.S. Cl. 425—131.1 **8 Claims**

1. A multiple extrusion apparatus, the multiple extrusion apparatus for the preparation of resinous film or sheet comprising

a plurality of sources of extrudable material,

a distribution manifold, the distribution manifold defining

a plurality of manifold inlet passageways each adapted to receive and pass a stream of extrudable material from one of the sources, the manifold inlet passageways each having

an inlet end and

an outlet end, the outlet ends of the passageways terminating on a generally planar face of the manifold, the manifold defining

a manifold discharge passage having inlet and outlet ends, the discharge passage inlet end terminating in a generally planar face,

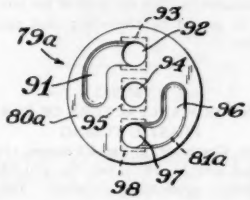
a slot die defining an elongate extrusion slot,

a die plenum in connection with the extrusion slot,

a die inlet feed passageway in communication with the plenum, the feed passageway having

an inlet end and

an outlet end, the extrusion slot being in full communication with the inlet end of the die inlet feed passageway, the die



feed passageway being in communication with the outlet of the manifold discharge passage,

a replaceable insert disposed between the outlets of the manifold inlet passageways and the inlet of the manifold discharge passageway, the insert having a plurality of channels therein providing selective communication between the outlet ends of the manifold passages and the inlet end of the manifold discharge inlet passage wherein the insert has a first end and a second end, the first end being disposed in mating relationship with the generally planar face of the manifold adjacent the outlet ends of the manifold inlet passages and the second end being disposed in mating relationship with the planar face of the manifold adjacent the inlet end of the manifold discharge passage.

3,924,991

INJECTION MOLDING APPARATUS

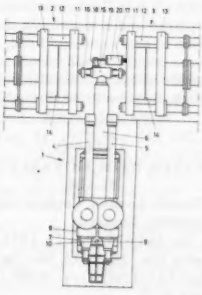
Robert Albert Melcher, Gerlingen, Germany, assignor to Schloemann-Siemag Aktiengesellshaft, Düsseldorf, Germany

Filed Apr. 22, 1974, Ser. No. 462,976

Claims priority, application Germany, June 7, 1973, 2329097

Int. Cl.² B29F *1/00*

U.S. Cl. 425—190 **1 Claim**



1. Injection molding apparatus for the fabrication of molded parts, consisting of:

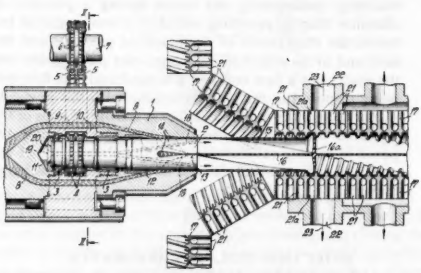
a. a base,
b. a first mold and a second mold mounted on the base, each having a sprue, the sprue of the first and second molds facing one another, and being separated by a first distance,
c. an injection unit having an injection distributing part located between the sprues of the molds and having at least two oppositely facing controllable jets adapted to alternately engage the sprues of the molds, the injection unit being mounted on the base for pivotal movement about an axis which is a second distance from the sprues,
d. a swing device between the injection unit and the base, the swing drive being adapted to cause pivotal movement of the injection unit to cause engagement of a jet with a sprue, the second distance being several times larger than the first distance, so that the path of the jets as the injection unit is moved by the swing unit approximates a straight line.

3,924,992

APPARATUS FOR MANUFACTURE OF PARTITIONED PLASTIC TUBING

Wilhelm Hegler, Goethestr. 2, Bad Kissingen, Germany

Filed July 25, 1972, Ser. No. 274,945
Claims priority, application Germany, July 31, 1971, 2138437
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² B29C *23/00*; B29D *23/04*
U.S. Cl. 425—233 **6 Claims**



1. In an apparatus for the manufacture of plastic tubing comprising an extrusion head, a generally annular orifice through which molten plastic can flow, said annular orifice in fluid communication with a reservoir and a mandrel disposed within said extrusion head around which plastic flows, the improvement which comprises at least one radial discharge slit in said mandrel, through which molten plastic can flow to define a wall which slit is in fluid communication with a reservoir for molten plastic and a mold train disposed in a downstream relationship to said extrusion head, means for aspirating air from closed molds in said mold train and means for rotating said mandrel about its common axis with the longitudinal axis of the plastic tube to be formed.

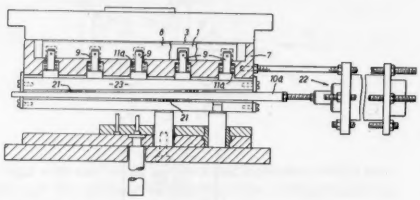
3,924,993

MOLD APPARATUS WITH MOVABLE WEB FORMING BLADE

Christopher E. Terrell, London, England, assignor to Twinlock Limited, Beckenham, England

Division of Ser. No. 164,626, July 21, 1971, abandoned. This application Dec. 28, 1973, Ser. No. 429,188
Int. Cl.² B29C *1/14*; B29F *1/00*
U.S. Cl. 425—242 R **3 Claims**

1. Apparatus for making a plastic article having at least two portions integrally interconnected by at least one thinner web of the same material, said apparatus comprising:
a. a mould providing a mould cavity and having at least one sprue through which material can be injected into said cavity;
b. means for injecting substantially homogeneous molten plastic material under high pressure through said at least one sprue into said cavity;
c. at least one elongate blade movable into said cavity perpendicularly to the longitudinal axis of said blade, for locally reducing the cross-section of the material in said cavity thereby to form said at least one web;
d. a single elongate force-transmission member operatively connected to and extending parallel to said at least one blade outside of said mould cavity, said force-transmission member having a single taper surface, remote from



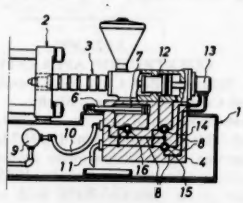
said cavity, that is inclined in the direction of the longitudinal axis of said blade;
e. a fixed bearing member disposed at a spacing from said force-transmission member;
f. a single elongate taper member reciprocally displaceable between said force-transmission member and said fixed bearing member and having a pressure surface co-operable with said single inclined surface of said force-transmission member thereby to cause said at least one blade to be driven into said mould cavity to form said at least one web; and
g. actuating means operable to displace said taper member between said force-transmission member and said fixed bearing member.

3,924,994

INJECTION DEVICE FOR SYNTHETIC RESIN INJECTION MOLDING

Katashi Aoki, 6037 Ozaz Minamijo, Sakaki, Hanishina-gun, Nagano, Japan

Continuation-in-part of Ser. No. 226,812, Feb. 16, 1972, abandoned. This application June 17, 1974, Ser. No. 480,177
Claims priority, application Japan, Feb. 27, 1971, 46-9818
Int. Cl.² B29F *1/00*
U.S. Cl. 425—242 R **6 Claims**



1. In an injection molding machine for a synthetic resin including a mold clamping device, an oil pump all mounted upon a stationary bed, and an injection cylinder with a ram and a screw in a heating cylinder all horizontally disposed said injection device being reciprocably mounted upon said stationary bed, the improvement comprising:
A. a block slidably mounted on said bed and movable reciprocably in a horizontal plane toward and away from said

mold clamping device said block further including a horizontal and planar upper surface;

B. said injection device further including a horizontal and planar lower surface removably coupled to said planar upper surface of said block and thereby integrally horizontally movable therewith, said injection device further including an oil motor coupled through said ram to said screw in said heating cylinder;

C. a cylinder and piston for reciprocating said injection device to obtain a nozzle-touch of said injection device wherein;

D. said block includes a cavity therein defining said cylinder, said piston being mounted and operatively contained in said cylinder, a piston rod connected to said piston extending out of said block and being fixedly attached to said bed and fixedly positioning said piston with respect to said bed, said block containing said cylinder being horizontally movable with respect to said fixed piston mounted therewithin;

E. said reciprocal block further comprising therein a plurality of hydraulic circuits, including circuits for controlling said ram in said injection cylinder and said oil motor of said injection device, and a nozzle-touch control circuit opening into spaced positions in said cylinder on opposite sides of said piston operable for controlling said horizontal reciprocating movement of said block with respect to said piston and;

F. a plurality of control valve means respectively in said plurality of hydraulic circuits;

G. wherein all of said hydraulic control circuits and said valve means are incorporated and consolidated into said block with said ram communicating therewith by passages including ports through said horizontal upper surface of said block; and

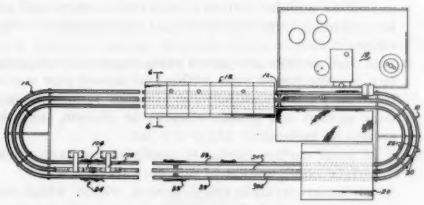
H. said hydraulic circuits fluid pressure supply is by a single main pressurized fluid inlet on said block which is connected to said oil pump through a flexible pipe.

3,924,995

APPARATUS FOR MOLDING ARTICLES

Russell W. Crooks, Lachute, and Gregory Maya, Laval, both of Canada, assignors to Electromould Engineering Limited, Lachute, Canada

Filed Dec. 23, 1974, Ser. No. 536,960
Int. Cl.² B29C *3/00*; B29F *1/08*; B29H *7/08*
U.S. Cl. 425—243 **13 Claims**



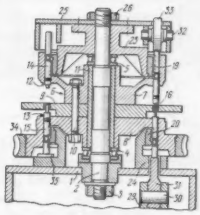
1. An apparatus for molding articles comprising a conveyor for carrying mold members, wherein the mold members are split to open in opposite directions laterally to the direction of travel of the conveyor, a first heating means for heating the mold members as they are opened and passing on the conveyor, means downstream of the heating means for closing the mold members, moldable plastic injecting means downstream of the mold closing means for injecting plastic into the closed mold, means downstream of the plastic injecting means for opening the mold, and means downstream thereof for automatically lifting and removing the plastic molded articles from the open mold.

3,924,996

ROTARY TABLET-MAKING MACHINE

Nikolai Semenovich Talis, ulitsa Zhelyabova, 13, kv. 28, and Anatoly Illarionovich Jursakov, ulitsa Zhelyabova, 13, kv. 32, both of Angarsk, Irkutskoi oblasti, U.S.S.R.

Filed Nov. 19, 1973, Ser. No. 416,944
Int. Cl.² B29C *3/00*
U.S. Cl. 425—348 R **1 Claim**



1. A rotary machine for pressing small tablets from powdery substances, comprising in combination: a base carrying a central column; a rotor journalled in said base and consisting of two juxtaposed, coaxially arranged, respectively upper and lower assemblies separated by a counter-die table and having respective body portions; a lower ring member fixed to said base, and a symmetrically disposed but juxtaposed upper ring member supported by said base through the intermediary of said column; said ring members defining circumferentially arranged, symmetrical bores and annular slots encircling said bores from within; upper and lower plungers mounted substantially parallel with the rotor axis, accommodated in said bores, and having cylindrical bodies provided with substantially central annular grooves having tapered end walls and respective engaging surfaces midway of said plungers; upper and lower cams accommodated in the respective assemblies within said annular slots, and having tapered helical working surfaces acting upon said engaging surfaces of the plungers to axially reciprocate the latter from within; said assemblies being provided with small annular recesses in the regions of said bores, extending over a fraction of the height of the respective assembly, corresponding to the limited amount of axial movement allowed for said plungers, said cams being mounted on support lands in said body portions of the rotor assemblies, formed by said annular recesses; said cams and said plungers being arranged so that said cam working surfaces cooperate with surfaces of said annular grooves; said annular slots, said cams therein, and said small annular recesses of the assemblies constituting means for limiting the axial movement of said plungers so that said surfaces of the annular grooves do not pass beyond said bores that accommodate said plungers during their reciprocation.

3,924,997

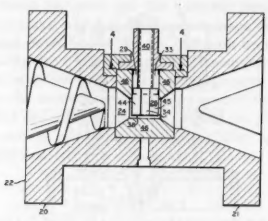
APPARATUS FOR DRYING POLYMERIC MATERIAL

Edward J. Kosinsky, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 21, 1972, Ser. No. 282,252
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² B29F *1/03*, *1/06*
U.S. Cl. 425—376 **7 Claims**

1. In an apparatus for removing liquid from liquid-bearing polymeric material comprising an elongated shell having an upstream feed opening and a downstream discharge zone, means in a first zone within said elongated shell for working and compacting the material passed therethrough and through a second downstream zone adjacent said discharge zone to the discharge zone of said elongated shell, a restriction means positioned between said first and second zone for restricting

the passage of material from said first zone to said second zone for reducing the pressure on the polymeric material passing through said restriction means, and a die having at least one orifice and being positioned downstream of said restriction means and said second zone and at said discharge zone for reducing the pressure on the material passing through the orifice of said die, the improvement comprising:



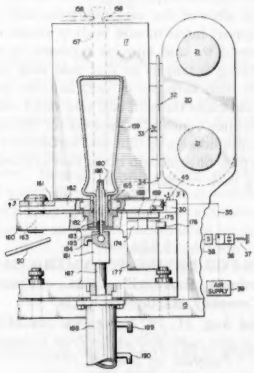
said restriction means being a valve having a valve body, an opening extending therethrough in fluid communication with the first and second zones, and a valve plug movably positioned within said valve body, said opening and said valve plug each having sidewalls and bottom walls of matable, planar configurations, said valve plug being slidably movable into and from said opening, and said valve plug having a hexagonal cross-sectional configuration with first and second opposed sidewalls of the valve plug contacting opposed side walls of said opening.

3,924,998

BLOW MOLDING APPARATUS HAVING SIDE DISCHARGE OF FINISHED ARTICLES

Lawrence A. Moore, Rockford, Ill., assignor to Beloit Corporation, Beloit, Wis.

Filed Aug. 17, 1972, Ser. No. 281,302
Int. Cl.[2] B29D *23/03*
U.S. Cl. 425—387 B **15 Claims**



1. An apparatus for blow molding preforms into finished articles comprising:

a heating means for heating said preforms,

mold means to shape said preforms during the blowing of the preforms into finished articles,

means to transfer said performs from the heating means to the mold means, and

discharge means for exerting a generally horizontally directed force on the finished articles in a first generally horizontal direction to move the finished articles in said first generally horizontal direction away from said mold means to a finished article receiving means,

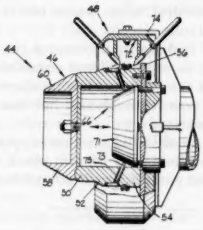
said mold means including mold halves arranged for relative movement along a second generally horizontal direction between open and closed positions, said second generally horizontal direction being essentially transverse to said first generally horizontal direction, said mold means including means for enclosing between the mold halves at least a portion of said preform in said closed position, and including means for blowing said preform into the shape of a finished article.

3,924,999

BELL END OF BELL AND SPIGOT JOINT AND METHOD AND ASSEMBLY

Allan Harris, Santa Ana, and Lemuel Hampton Huff, Paramount, both of Calif., assignors to Johns-Manville Corporation, Denver, Colo.

Continuation-in-part of Ser. No. 408,771, Oct. 23, 1973, abandoned. This application July 18, 1974, Ser. No. 489,624
Int. Cl.[2] B29C *1/00*
U.S. Cl. 425—392 **5 Claims**



1. An assembly for use in forming a bell end having an inner-circumferential groove in a heat deformable pipe section heated to its range of thermoplastic deformability said assembly comprising:

a. a core section having a longitudinally extending axis, a predetermined outer surface configuration and being adapted to support a circumferential sealing gasket around an annular portion of said core section, said gasket extending outwardly from said outer surface configuration;

b. said core section and gasket being adapted for insertion to a predetermined point within said heated pipe section by relative movement between said pipe section and said core section and gasket whereby to deform said pipe section to include:

i. an inner surface similar in configuration to the outer surface configuration of said core section, and

ii. an inner-circumferential groove within which said gasket is located, the longitudinal extent of said groove being defined by longitudinally spaced circumferential surfaces located on said pipe section and extending outwardly from said inner surface of said pipe section on opposite sides of said gasket and

c. first and second deforming means located outwardly of an adjacent said core section on opposite sides of said annular portion of said core section and movable along straight line paths extending toward said annular portion at acute angles with the axis of said core section between first positions spaced from said heated pipe section after formation of said groove and second positions so that, in said second positions, each of said deforming means is adapted to engage against said pipe section and decrease the longitudinal distance between at least one pair of

longitudinally aligned surface segments along said outwardly extending surfaces defining said groove.

3,925,000

MOLDING APPARATUS INCLUDING CONICALLY-SHAPED COMPACTING MEMBER

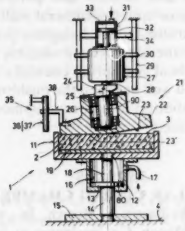
Wilhelm Häberle, Industriegelande, 7481 Scheer, Wurttemberg, Germany

Filed July 5, 1974, Ser. No. 486,066

Claims priority, application Germany, Sept. 29, 1973, 2349132; Mar. 22, 1974, 2413785

Int. Cl.² B28B *3/08*

U.S. Cl. 425—422 **17 Claims**



1. A device for compacting and forming pourable, compactable or moldable materials which are formed in molds, particularly for compacting fresh concrete, comprising a forming mold, support means for supporting said forming mold, a compacting member having a bottom material contacting surface which is at least partly conical, a support shaft rotatably supporting said compacting member, said support shaft having an axis line intersecting the apex of said conical surface and inclined from the normal to the surface of said mold and the material being compacted therein, a motor driven rotatable crank connected to said support shaft and being rotatable about an axis normal to the surface of said mold and intersecting the apex of the conical surface to revolve said support shaft and to cause said compacting member to wobble about the apex of said conical surface, said compacting member conical surface being engageable on the surface of the material during its wobbling movement.

3,925,001

PLACEMENT OF CATALYTICALLY ACTIVE MATERIALS IN COMBUSTION FLAMES

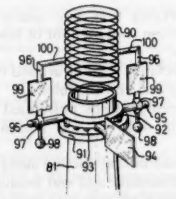
Kailish Chander Salooja, Reading, England, assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Dec. 15, 1970, Ser. No. 98,338

Claims priority, application United Kingdom, Dec. 19, 1969, 61916/69; July 29, 1970, 86707/70

Int. Cl.² F23J *7/00*

U.S. Cl. 431—4 **7 Claims**



1. A method of improving the combustion of a carbon-containing fuel in a flame, comprising fixedly disposing in the primary reaction zone characterized by the flame having its highest ion concentration, a solid material which is catalytically active for reducing smoke and which is substantially involatile at the temperature of the primary reaction zone, wherein the catalytically active material is selected from the combination of compounds of barium and sodium, barium and yttrium, barium and erbium, barium and zirconium, aluminium and sodium, aluminium and yttrium, aluminium and lanthanum, aluminium and erbium, aluminium and platinum, gallium and sodium, zirconium and yttrium, zirconium and erbium, zirconium and chromium, zirconium and manganese, zirconium and iron, zirconium and platinum, manganese and sodium, manganese and yttrium, manganese and titanium, manganese and chromium, manganese and iron, manganese and nickel and palladium and iron.

3,925,002

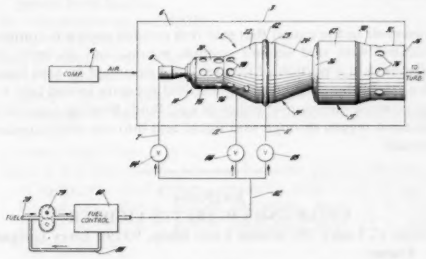
AIR PREHEATING COMBUSTION APPARATUS

Albert J. Verdouw, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 11, 1974, Ser. No. 522,683

Int. Cl.² F23M *3/04*

U.S. Cl. 431—10 **9 Claims**



1. A combustion apparatus for a gas turbine engine or the like comprising, in combination, a housing adapted to receive air under pressure and a combustion liner in the housing; the combustion liner having an upstream end and a downstream outlet end and defining, in flow sequence from the upstream end to the downstream end, an air preheating combustor, a fuel vaporizer, a main reaction zone, and a main dilution zone; the air preheating combustor comprising a preheat reaction zone having means for admitting preheat combustion air and fuel and a preheat dilution zone having means for admitting dilution air and mixing the dilution air with the combustion air from the preheat reaction zone to provide at least substantially all combustion air for the main reaction zone, in combination with means to proportion the fuel and air so as to discharge a combustion products and air mixture from the preheating combustor at approximately 600° Celsius into the fuel vaporizer; the fuel vaporizer comprising means defining a passage leading from the preheating combustor to the main reaction zone, and means for delivering fuel into the said passage for evaporation and mixture with the gases flowing through the said passage; and the main dilution zone defining entrances for dilution air by-passing the preheating combustor.

3,925,003

GAS FLOW CONTROL SYSTEM

Andrew A. Kutler, South Orange, N.J., and Joseph F. Keegel, Jr., St. Croix, V.I., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

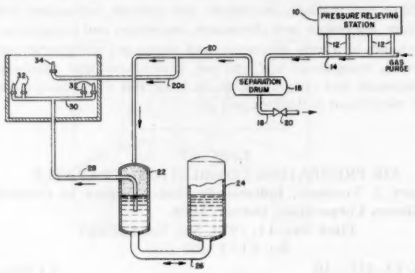
Filed Sept. 5, 1974, Ser. No. 503,417

Int. Cl.² F23N *1/00*

U.S. Cl. 431—89 **6 Claims**

1. A fluid flow control system comprising a tank containing a liquid, a reservoir connected to said tank for permitting the introduction and withdrawal of said liquid to and from said tank to maintain said liquid at a predetermined level in said tank, first conduit means connected to a source of a first fluid

and communicating with the interior of said tank at a point above said liquid level, second conduit means communicating with a second fluid and communicating with the interior of said tank at a point below said liquid level so the said liquid normally prevents flow of either of said fluids from one of said conduit means to the other unless the pressure of said first fluid is sufficient to displace said liquid from said tank to said



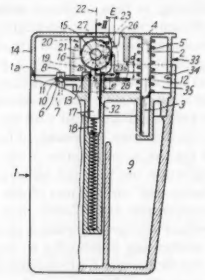
reservoir to the extent that said first conduit means is communicated with said second conduit means, and an inert gas disposed in a portion of said tank not occupied by said liquid for establishing a predetermined fluid pressure in said tank for preventing diffusion of either of said fluids from its respective conduit means through said liquid and into the other conduit means.

3,925,004

CIGAR AND CIGARETTE LIGHTER

Gilles C. Lauri, 29, avenue Leon Blum, 93190 Livry Gargan, France

Filed Apr. 3, 1974, Ser. No. 457,544
Claims priority, application France, Apr. 6, 1973, 73.12554
Int. Cl.² F23Q *2/08*
U.S. Cl. 431—131 **5 Claims**



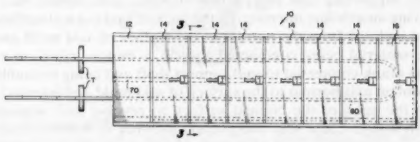
1. A lighter comprising,
a casing having a fuel reservoir therein;
a burner tip mounted in the casing;
selectively operable valve means for providing communication between said reservoir and said burner;
means in said casing for supporting a flint therein;
friction means movably mounted in said casing for generating a fuel-igniting spark upon movement thereof;
at least one lug operatively connected to said friction means for movement therewith;
a pushbutton slidably mounted in said casing for vertical sliding movement with respect to the casing and being operatively connected to said friction means for moving the same to produce a spark upon downward movement of the pushbutton; and
means operatively connecting said pushbutton to said valve means for opening the valve only after the pushbutton has moved through a major portion of its downward stroke;
said pushbutton having a groove formed therein extending generally perpendicularly of the direction of movement of the pushbutton and receiving said lug, thereby to actuate said friction means upon downward movement of the pushbutton, said groove having a length which is at least equal to the amount of clearance required therein to accommodate movement of the lug, in the direction of the groove, during downward movement of the pushbutton;
said pushbutton also including a peripheral wall portion and an elongated piston extending from one side of the pushbutton between and beyond said peripheral wall; said casing including an upper peripheral wall defining a well in the casing and slidably receiving the peripheral wall of the pushbutton therein, a bore slidably receiving said piston, and a helical coil spring coaxially arranged about the pistion in said well between the pushbutton and casing to urge the pushbutton to a normal upmost position with respect to the casing.

3,925,005

MODULAR CURING CHAMBER

William F. Everhardt; Henry L. Brown, Jr., and Clement O. Dennis, Sr., all of Macon, Ga., assignors to American Power Tread Corporation, Macon, Ga.

Filed Oct. 4, 1974, Ser. No. 512,080
Int. Cl.² F27B *9/02, 9/12*
U.S. Cl. 432—82 **7 Claims**



1. A modular chamber for curing a heat curable adhesive and thereby bonding a prevulcanized tread strip to a tire carcass, said chamber comprising:
a. an entrance-exit module, and end module, and at least one intermediate module,
b. said entrance-exit module including a partition wall dividing said module into entrance and exit portions,
c. said at least one intermediate module including a partition wall dividing said intermediate module into two portions,
d. means for conveying tires into said entrance portion around said partition wall and out of said exit portion in a U-shaped path,
e. panel members defining ducting around the outer walls of said intermediate and end modules,
f. a plurality of heating lamps positioned in said ducting along the bottom walls of said intermediate and end modules,
g. a blower positioned in said ducting along the top walls of each of said intermediate and end modules,
h. said blower drawing air over said heating lamps and up through said modules around the tires and forcing the air through said ducting around the outer walls of said modules in a cyclic path so as to provide even heating throughout said chamber and promote even curing of the heat curable adhesive in said chamber.

3,925,006
CATIONIC DYEABLE CELLULOSE ESTERS WITH IMPROVED DYEABILITY

Alex S. Forschirm, Lake Hiawatha, and Kurt F. Wissbrun, Short Hills, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Nov. 26, 1971, Ser. No. 202,661
Int. Cl.² D06P *3/40, 3/46*
U.S. Cl. 8—4 **21 Claims**

1. An improved process for dyeing shaped articles of cellulose esters comprising:

a. including in a cellulose ester spinning dope from about 0.5 to about 5 percent by weight of the cellulose ester of a compound selected from the group consisting of sodium tungstophosphate and sodium tungstosilicate;

b. forming a shaped article from the said dope; and

c. contacting the shaped article with an aqueous dyebath containing a cationic dye and a temperature of from about 75° to about 125°C.

3,925,007
DISPERSE DYE CONCENTRATE WITH SAWDUST

Peter Gurtler, 24 Neusatzweg, Therwil, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Sept. 21, 1972, Ser. No. 291,104
Claims priority, application Switzerland, Sept. 30, 1971, 14209/71
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² D06P *1/46*
U.S. Cl. 8—91 **1 Claim**

1. A composition for use as a textile dyeing agent in an extraction process consisting essentially of 40 to 70% by weight of a disperse dyestuff carried on 80 to 30% by weight of wood sawdust and 0 to 10% by weight of an adhesive selected from mineral oil, glycerin, sorbitan fatty acid ester or carboxymethylcellulose.

3,925,008
METHOD FOR SIMULTANEOUSLY SCOURING AND BLEACHING MATERIALS CONSISTING OF TEXTILE FIBERS

Syoso Makino; Kenjiro Hosokawa, both of Osaka, and Junzi Sano, Amagasaki, all of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Filed Sept. 5, 1974, Ser. No. 503,248
Claims priority, application Japan, Sept. 13, 1973, 48-103624
Int. Cl.² D06L *3/02*
U.S. Cl. 8—111 **21 Claims**

1. A method for simultaneously scouring and bleaching materials consisting of textile fibers in a non-aqueous medium, which comprises the steps of

preparing a non-aqueous scouring and bleaching liquid by adding at least one peroxide bleaching agent and at least one organic carbonate selected from the group consisting of alkylene carbonate and hydroxyalkylene carbonate in a ratio by weight of 10 : 1 to 1 : 5 into a halogenated hydrocarbon solvent, and

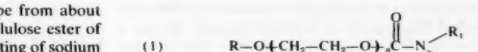
treating a material consisting of textile fibers by impregnating the material with said above-prepared non-aqueous scouring and bleaching liquid, heating the impregnated material with steam, and thereafter washing the material with a washing solvent.

3,925,009
FATTY GROUP CONTAINING METHYLOLATED, POLYOXYALKYLENE CARBAMATES AND TEXTILE MATERIALS SOFTENED BY TREATMENT THEREWITH

Thomas F. Rutledge, and John D. Zech, both of Wilmington, Del., assignors to ICI United States Inc., Wilmington, Del.

Filed June 9, 1969, Ser. No. 831,756
Int. Cl.² C07C *125/04, 125/06;* **D06M** *15/54, 3/16*
U.S. Cl. 8—115.7 **12 Claims**

5. A carbamate characterized by the formula

(1) 

(2) $R_3(OA)_x$,

(3)

(4) $(R_5O)_yD$

wherein R is an acyl group containing from 12 to 28 carbon atoms or the group resulting from removing a hydroxyl group from lanolin,

R_1 is hydrogen or $-CH_2OH$,

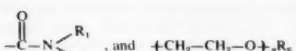
R_2 is $-CH_2OH$,

n is an integer from 1 to 150,

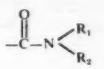
R_3 is the group remaining after removing all the hydroxyl groups from a saturated, aliphatic polyhydric alcohol having from 3 to 6 carbon atoms and from 2 to 6 hydroxyl groups,

x is an integer from 2 to 6,

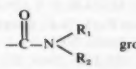
each A is independently selected from the group consisting of hydrogen, alkyl groups containing from 12 to 28 carbon atoms, alkenyl groups containing from 12 to 28 carbon atoms, acyl groups containing from 12 to 28 carbon atoms,



wherein R_6 is hydrogen, an acyl group containing from 12 to 28 carbon atoms, or



with the proviso that at least one A contains an alkyl, alkenyl, or acyl group containing from 12 to 28 carbon atoms, at least one A contains a $-CH_2CH_2O-_n R_6$ group, and at least one A contains a

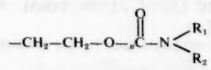


group,

R_4 is an alkyl group containing from 12 to 28 carbon atoms or an alkenyl group containing from 12 to 28 carbon atoms,

each B is independently selected from the group consisting of alkyl groups containing from 1 to 28 carbon atoms, alkenyl groups containing from 1 to 28 carbon atoms, and $-CH_2-CH_2-O-_n R_{10}$ wherein R_{10} is hydrogen or

with the proviso that at least one B contains a



group, R_5 is H or

with the proviso that at least one R_5 is

y is a number from 1 to 5, and D is the group remaining after removing all the hydroxyl groups from an adduct of ethylene oxide and a partial fatty acid ester of a polyol having from 2 to 6 hydroxyl groups and from 3 to 6 carbon atoms, said fatty acid containing from 12 to 28 carbon atoms.

11. A process of treating textile material containing cotton and nylon which comprises depositing a carbamate of claim **5** and an acidic textile resin catalyst on the surface of the textile material and thereafter curing by heating the textile material to an elevated temperature.

12. An article of manufacture comprising textile material treated in accordance with the process of claim **11.**

3,925,010

DRY CLEANING PROCESS UTILIZING AZEATROPIC NONFLAMMABLE VAPORS

Oliver A. Barton, Florham Park, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

Division of Ser. No. 158,129, June 29, 1971, Pat. No. 3,794,590. This application Dec. 3, 1973, Ser. No. 421,192

Int. Cl. D06l *1/00*

U.S. Cl. 8—142 **4 Claims**

1. A process for dry cleaning a soiled textile fabric or fiber which comprises contacting said textile fabric or fiber with the mixture comprising about 87.0 to about 88.9 weight percent tetrachlorodifluoroethane, about 7.0 to about 11.0 weight percent tertiary amyl alcohol and about 0.1 to about 6.0 weight percent water in the liquid phase and evaporating the liquid which adheres to the textile fabric or fiber, thereby removing the tertiary amyl alcohol in a non-flammable azeotropic composition containing tetrachlorodifluoroethane.

3,925,011

EMULSIFYING CARRIER COMPOSITIONS AND PROCESS FOR EMULSIFYING CARRIERS CONTAINING HYDROXYARYL GROUPS

Gunther Boehmke, Leverkusen-Grossendriesch, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed Aug. 24, 1972, Ser. No. 283,300

Claims priority, application Germany, Aug. 24, 1971, 2142318

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² D06P *5/04*; **B01F** *17/12*

U.S. Cl. 8—169 **6 Claims**

1. In the known process for emulsifying carriers (dyeing accelerators) containing hydroxyaryl groups selected from the group consisting of o-, m- and p-hydroxydiphenyl; o-, m- and p-benzylphenol; o-, m- and p-(α-phenyl)-ethyl-phenol; benzylcresols; α-(phenyl)-ethyl-chlorophenols; phenylchlorophenols, and cresotic acid esters in aqueous dyeing baths by means of emulsifiers the improvement which comprises using as the emulsifier a mixture consisting essentially of

a. alkali metal salts and/or ammonium salts of saturated or unsaturated fatty acids substituted by 1, 2 or 3 hydroxyl groups, and

b. alkali metal salts, alkaline earth metal salts and/or ammonium salts of organic sulphonic acids possessing at least 10 C atoms, and

wherein components (a) and (b) of the said mixture are present in a weight ratio of 15 : 75 to 80 : 20 and wherein said mixture is employed in an amount of 3 to 30 percent by weight relative to the weight of the carrier.

3,925,012

PROCESS FOR DYEING FIBRE MATERIAL CONTAINING NH-GROUPS FROM ORGANIC SOLVENTS

Paul Ringel, Leverkusen-Wiesdorf; Dietrich Hildebrand, Leverkusen, and Gunter Breidbach, Cologne-Flittard, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Continuation of Ser. No. 859,207, Sept. 18, 1969, abandoned, which is a continuation-in-part of Ser. No. 791,777, Jan. 16, 1969, abandoned. This application May 17, 1974, Ser. No. 470,827

Claims priority, application Germany, Aug. 2, 1968, 1769902

Int. Cl.² D06P *5/04*

U.S. Cl. 8—169 **3 Claims**

1. A process for dyeing natural or synthetic polyamide fiber material containing NH-groups comprising the steps of

1. immersing the fiber materials in a dyebath consisting essentially of

a. an organic solvent; said organic solvent consisting of chlorohydrocarbon having a boiling point of 40° to 150°C.;

b. an amine salt of a dyestuff or an amine adduct of a dyestuff; said dyestuff containing 1–4 carboxylic acid or sulfonic acid groups, said amine having at least eight carbon atoms, at least three of which are in an uninterrupted chain; and

c. 0.01 to 0.5% by weight of water based on the weight of the chlorohydrocarbon;

2. dyeing the fiber material until the dyebath is exhausted; and then

3. removing the dyed fiber materials from the exhausted dyebath.

3,925,013

EUTECTIC BIPHENYL-NAPTHALENE DYE CARRIERS

Gordon L. Axon, and Beverly K. Montezinos, both of Charlotte, N.C., assignors to Catawba Chemicals, Inc., Charlotte, N.C.

Filed May 23, 1973, Ser. No. 363,213
Int. Cl.[2] D06P 5/04
U.S. Cl. 8—173 24 Claims

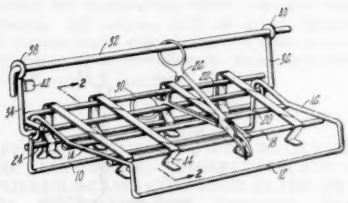
1. A aqueous dye carrier composition for dyeing synthetic materials including polyesters and triacetates comprising in combination a solvent, emulsifier, and a eutectic mixture of biphenyl and naphthalene comprising 55–70% by weight biphenyl, and 30–45% by weight naphthalene, said eutectic mixture having a eutectic temperature in the range of 36°–46°C., said dye carrier composition including sufficient solvent so that the combination remains in liquid form at temperatures below 36°C.

3,925,014

INSTRUMENT STERILIZATION

Robert S. Langdon, R.F.D. No. 1, East Hampton, Conn. 06424

Filed June 26, 1974, Ser. No. 483,228
Int. Cl.[2] A61L 3/02; A47F 7/00
U.S. Cl. 21—105 10 Claims



1. A surgical instrument rack for supporting instruments during the cleaning and sterilization of said instruments comprising:

means for supporting a plurality of elongated hinged instruments in side-by-side alignment, said supporting means consisting of an open-work frame means comprising plural support surface means whereby each instrument is supported by at least two said support surface means, said at least two said support surface means being horizontally and vertically offset from each other whereby the handle ends of instruments disposed on said supporting means are displaced vertically above the working ends thereof; means for releasably engaging one handle portion of each of the instruments disposed on said supporting means;

frame extension means connected to said supporting means frame for receiving and supporting said releasably engaging means vertically above an inclined plane defined by said support surface means whereby an engaged instrument handle portion will be displaced away from the other handle portion of each such engaged hinged instrument and the instruments may be held in the open condition during cleaning and sterilizing; and

instrument retaining means, said retaining means separably engaging said supporting means and cooperating with said supporting means and the instruments disposed thereon to prevent accidental separation of instruments from the frame when in an installed position, said retaining means being removed from contact with said supporting means when it is desired to use the instruments.

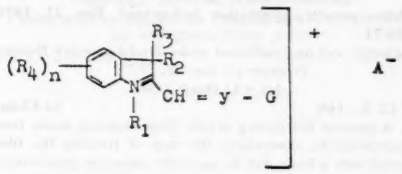
3,925,015

PROCESS FOR DYEING ANIONICALLY MODIFIED SYNTHETIC FIBER MATERIALS

Hans-Peter Kuhlthau, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed Oct. 24, 1972, Ser. No. 299,658
Claims priority, application Germany, Oct. 23, 1971, 2152948
Int. Cl.[2] D06P 1/13
U.S. Cl. 8—168 4 Claims

1. In the process of dyeing an anionically modified fiber material by exhaustion from a dyebath consisting essentially of a cationic dyestuff dissolved in halogenated hydrocarbon the improvement comprising the use as said cationic dyestuff a dyestuff soluble in said halogenated hydrocarbon and having the formula



in which A^- is a non-lipophilic anion;

R_1 is hydrogen; alkyl of 1 to 12 carbon atoms; alkyl of 1 to 5 carbon atoms substituted with CN, Cl or OH; cycloalkyl, aralkyl or aryl;

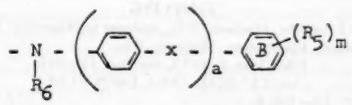
R_2 is alkyl of 1 to 5 carbon atoms, cycloalkyl or aralkyl;

R_3 is alkyl of 1 to 5 carbon atoms, cycloalkyl or aralkyl;

R_4 is halogen, alkyl of 1 to 12 carbon atoms, alkyl of 1 to 5 carbon atoms substituted with CN, Cl or OH, cycloalkyl, aralkyl, alkoxy, nitro, carbalkoxy, nitrile, acyl, acylamino, amino, carbamoyl, N-alkyl-carbamoyl, N,N-dialkylcarbamoyl, N-alkyl-N-arylcarbamoyl, sulphamoyl, N-alkylsulphamoyl, N,N-dialkyl-sulphamoyl, alkylsulphonyl, arylsulphonyl, trifluoromethyl, aryloxy, aralkoxy or carbalkoxy;

Y is CH or N;

G is



R_5 is halogen, alkyl or 1 to 12 carbon atoms, alkyl of 1 to 5 carbon atoms substituted by CN, Cl, or OH, cycloalkyl, aralkyl, alkoxy, nitro, carbalkoxy, nitrile, acyl, acylamino, amino, carbamoyl, N-alkyl-carbamoyl, N,N-dialkylcarbamoyl, N-alkyl-N-arylcarbamoyl, sulphamoyl, N-alkylsulphamoyl, N,N-dialkyl-sulphamoyl, alkylsulphonyl, arylsulphonyl, trifluoromethyl, aryloxy, aralkoxy or carbaralkoxy;

R_6 is hydrogen; alkyl of 1 to 4 carbon atoms; alkyl of 1 to 4 carbon atoms substituted by carbalkoxy of 1 to 5 carbon atoms or alkoxy of 1 to 5 carbon atoms; cycloalkyl, aralkyl or alkenyl of 1 to 5 carbon atoms;

m, n independently of one another are numbers from 0 to 3;

"aryl" is phenyl; naphthyl; 4-methyl-phenyl, 2-methylphenyl, 4-chlorophenyl, 2-chlorophenyl, or 2-methylchlorophenyl;

"aralkyl" is benzyl, β-phenethyl or α,α-dimethylbenzyl; or the foregoing substituted in the phenyl nucleus by lower alkyl, halogen, alkoxy, carboalkoxy, nitro, cyano or hydroxyl;

"aryloxy" is phenoxy or naphthoxy or the foregoing substituted with lower alkyl, halogen, alkoxy, carboalkoxy, nitro, cyano or hydroxyl;

x is CH_2—or 0;

a is 0 or 1; and

where at least one of the substituents R_4 or R_5, is alkyl of 3 to 12 carbon atoms, alkoxy of 3 to 12 carbon atoms or cycloalkyl of 5 to 6 carbon atoms or R_4 or R_5 is a methyl or ethyl in which case n or m has the value 3.

3,925,016
POLYARCRYLONITRILE BASIC DYEING PROCESS WITH ANIONIC ASSISTANT

Jaroslav Haase, Basel, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Dec. 12, 1972, Ser. No. 314,489

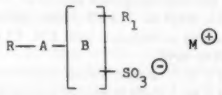
Claims priority, application Switzerland, Dec. 21, 1971, 18720/71

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² D06P *5/04*

U.S. Cl. 8—169 **24 Claims**

1. A process for dyeing textile fibre material made from polyacrylonitrile, comprising the step of treating the fibre material with a basic dye in an acidic, aqueous preparation, which further comprises as dyeing assistant an anionic compound of the formula



wherein R is an alkyl or alkylene radical with 7 to 21 carbon atoms, A is the group —CO—O— or —O—CO—, B is benzene, naphthalene or diphenyl, R_1 is hydrogen, hydroxyl, alkyl, hydroxyalkyl, alkoxy, cycloalkyl aryl, aralkyl or halogen, and M^+ represents an inorganic or organic cation.

3,925,017
PREPARATION OF DRY, POROUS GEL PARTICLES HAVING HIGH WATER REGAIN FOR LIQUID SAMPLING

Stuart J. Updike, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed May 1, 1973, Ser. No. 356,093

Int. Cl.² B01D *39/04*; **G01N** *31/06*

U.S. Cl. 23—230 B **5 Claims**

1. In the preparation of dry, porous polyacrylamide gel particles having high water regain for use in obtaining reproducible increments of liquid sample upon rehydration with the sample, the improvement comprising mixing the gel in particle form in a volatile, non-aqueous, water miscible, liquid organic solvent medium, removing the gel particles from the non-aqueous medium, and then allowing the gel particles to dry.

3,925,018
METHOD AND APPARATUS FOR QUANTITATIVE ANALYSIS UTILIZING PARTICULATE REAGENT MATERIAL

Alexander M. Saunders, Bedford Village, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

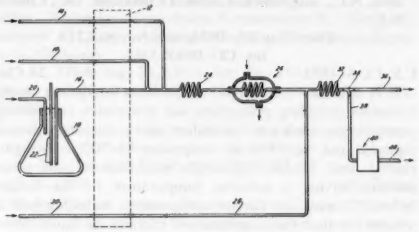
Filed June 8, 1973, Ser. No. 368,406

Int. Cl.² G01N *15/02, 21/26, 31/14, 33/16*

U.S. Cl. 23—230 R **5 Claims**

1. A method of analysis of plural constituents of a sample, comprising:

reacting the sample in the presence of a multitude of microholders suspended in a liquid, each microholder comprising a reagent, the reagent of certain of said microholders being different from the reagent of certain other microholders, and



determing products of reactions of said sample with said microholders as indications of the constituents.

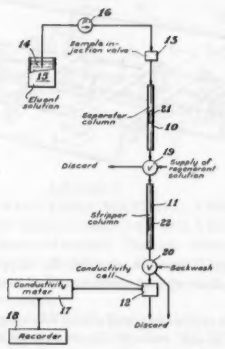
3,925,019
CHROMATOGRAPHIC ANALYSIS OF IONIC SPECIES

Hamish Small, and Timothy S. Stevens, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 6, 1973, Ser. No. 386,261

Int. Cl.² G01N *27/08, 31/04, 31/08*

U.S. Cl. 23—230 R **10 Claims**



1. The method of chromatographic quantitative analysis of a plurality of species of cations in aqueous sample solution, which comprises:

adding a predetermined amount of said sample solution to a cation exchange resin bed means, said means being charged with a cation exchange resin, and chromatographically separating said plurality of species of cations on eluting said cations from the said resin bed means with an aqueous solution of a developing reagent selected from $AgNO_3$ and $BaCl_2$, the cation exchange resin and developing reagent being preselected to cooperatively facilitate chromatographic separation of said cation species;

passing the effluent from the cation exchange resin bed means through an anion exchange resin bed means, said anion exchange resin bed means being charged with an anion exchange resin in a form selected from chloride form and sulfate form capable of (1) precipitating all of the developing reagent and (2) exchanging substantially all anions present to the form selected, the total exchange and precipitation capacity of the anion exchange resin

being at least sufficient to precipitate and exchange all of the developing reagent in said effluent, said precipitation and exchange being carried out while maintaining said chromatographic separation of said ion species;

and passing the effluent from said anion exchange resin bed means through a common detector means and quantitatively detecting each of said separated ion species, respectively.

3,925,020
METHOD FOR DETERMINING THE TOTAL IRON-BINDING CAPACITY OF BLOOD SERUM

Hiroshi Ogawa, Kashiwa; Kazuo Nitta, Yachiyo; Nobuhiko Nakazawa, Urawa, and Kentaro Maki, Tokyo, all of Japan, assignors to Mallinckrodt, Inc., St. Louis, Mo.

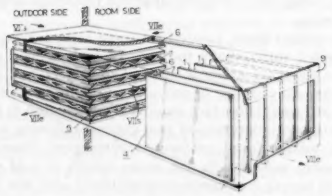
Continuation-in-part of Ser. No. 371,051, June 18, 1973, abandoned. This application Feb. 11, 1974, Ser. No. 441,165
Claims priority, application Japan, Mar. 5, 1973, 48-25926
Int. Cl. G01n *23/00, 33/16*
U.S. Cl. 23—230 B **6 Claims**

1. In the method for determining the total iron-binding capacity of blood serum which comprises adding an acid to a blood serum specimen to release the bound iron from the transferrin, removing the released iron, returning the pH of the remaining serum fraction to the range wherein quantitative binding of ferric ions to transferrin occurs, adding an excess of ferric ions including some radioactive ferric ions, measuring the initial activity of the resulting mixture, removing the unbound ferric ions, and determining the residual radioactivity, the improvement which comprises adding a polycarboxylic acid selected from the group consisting of malonic, tartaric, malic, maleic and oxalic acids to the blood serum specimen so as to release the bound iron from the transferrin therein.

3,925,021
APPARATUS COMPRISING A PLURALITY OF CHEMICALLY TREATED ABSORPTION PLATES FOR INJURIOUS GASES CONTAINED IN THE AIR

Masataka Yoshino; Hiroyasu Kuwazawa; Haruhiko Shimojima, all of Nakatsugawa; Osamu Tanaka, Amagasaki; Hideaki Kusakawa, Amagasaki; Hiromasa Matsuoka, Amagasaki, and Mitsuo Maeda, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 207,100, Dec. 13, 1971, abandoned. This application June 14, 1974, Ser. No. 479,572
Claims priority, application Japan, Dec. 28, 1970, 46-126084; Dec. 28, 1970, 46-126085; Mar. 22, 1971, 46-20135
Int. Cl.² B01J *1/00*
U.S. Cl. 23—252 R **4 Claims**

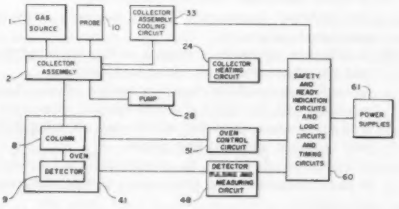


1. A device for removing acidic and injurious gases such as a sulfur dioxide gas, a hydrogen sulfide gas or acidic mist contained in the air, which comprises a plurality of absorption plates, spacing means positioned for maintaining the absorption plates apart so as to form a plurality of layers and interposition plates which are interposed in the space between said plurality of layers so as to guide two directional flows of air having different temperatures and humidities from one another alternately into said space, said absorption plates being made of a material selected from the group consisting of paper, asbestos paper, cloth or textile, said material being impregnated with a hygroscopic wetting agent to render the material hygroscopic, selected from the group consisting of glycerine, ethylene glycol or propylene glycol and an alkaline substance selected from the group consisting of hydroxides and carbonates of alkali metals and alkaline earth metals to neutralize said acidic and injurious gases or said acid mist.

3,925,022
DETECTING APPARATUS

Lane Crawford Showalter; John Leslie Brokenshire, both of Waterloo, and Geoffrey Brian Watts, Kitchener, all of Canada, assignors to Marsland Engineering Limited, Waterloo, Canada

Filed Sept. 26, 1974, Ser. No. 509,623
Claims priority, application Canada, Oct. 1, 1973, 182296
Int. Cl.² G01N *31/06, 31/08*
U.S. Cl. 23—254 E **25 Claims**



1. An apparatus for detecting a trace of a specific vapour in an atmospheric sample, comprising

a. a collector assembly having an inlet and an outlet and a passage extending from the inlet to the outlet, the passage being filled with a solid adsorbant which is capable of adsorbing the specific vapour together with other vapours in the atmospheric sample and which is capable of being readily heated to desorb the adsorbed vapours,

b. heating means for heating the adsorbant to desorb the adsorbed vapours,

c. a partition column connectable to the outlet of the passage for separating the desorbed vapours,

d. a detector connected to the partition column for detecting the specific vapour among the separated vapours,

e. a carrier gas source connectable to the inlet of the passage to provide a flow of a carrier gas so that the carrier gas passes the desorbed vapours to the partition column for separation and the separated vapours to the detector for detection of the specific vapour,

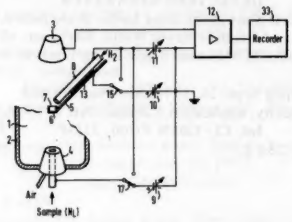
f. said collector assembly being movable between a sampling position where the passage is communicated with the atmosphere while disconnected to the partition column and the carrier gas source, and an analyzing position where the passage is connected to the partition column and the carrier gas source while disconnected to the atmosphere, and

g. means to draw the atmospheric sample over the adsorbant when the collector assembly is in the sampling position.

3,925,023
FLAME IONIZATION DETECTOR

Rudolf Kaiser, Dr.-Dahlem-Str. 9, 6702 Bad Durkheim, Germany

Filed Nov. 21, 1973, Ser. No. 418,121
Claims priority, application Germany, Nov. 21, 1972, 2257099
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] G01N *31/12*
U.S. Cl. 23—254 EF **10 Claims**



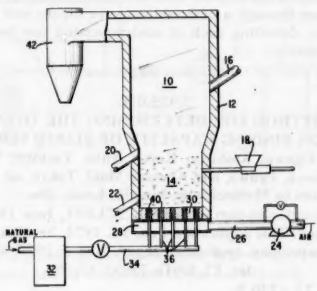
1. A flame ionization detector comprising:
a. an enclosed detection chamber having a central axis associated therewith;
b. a collector electrode arranged in the upper portion of said chamber, essentially along said axis;
c. a first burner nozzle in the lower portion of said chamber, arranged with its outlet directed upward along said axis;
d. a salt source supported within said chamber between said collector and said first nozzle;
e. a second nozzle having its opening directed downwardly in the direction of said first burner nozzle and onto said salt source;
f. means for supplying a sample to said first nozzle;
g. means for selectively supplying a fuel gas to one of said first and second nozzles;
h. a negative voltage supply;
i. means for supplying one of a ground and positive potential;
j. means coupling said negative supply to said second nozzle;
k. means for selectively coupling said first burner nozzle to one of said negative supply and said means for supplying one of a positive and ground potential, whereby, by selectively feeding said fuel gas to said second nozzle and coupling said first nozzle to said means for supplying one of a positive and ground potential, a nitrogen or other hetero compound sample may be fed to said first nozzle for detection, and by selectively feeding said fuel gas to said first nozzle and coupling said first nozzle to said negative supply a hydrocarbon may be fed to said first nozzle and detected.

3,925,024
GRID BURNER SYSTEM

Clinton Allen Hollingsworth, and John Harold Snyder, both of Lakeland, Fla., assignors to Borden, Inc., Columbus, Ohio

Filed Sept. 10, 1971, Ser. No. 179,494
Int. Cl.[2] F27B *15/10*; **B01J** *8/24*
U.S. Cl. 23—277 R **13 Claims**

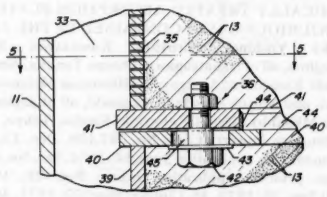
1. In a fluid bed reactor which includes a perforated grid, means for introducing particulate matter into said reactor, means for introducing fuel and air into said reactor for fluidizing the particulate matter and for affecting a thermal reaction between the particulate matter and the combusted air and fuel mixture and means for withdrawing treated particles from the reactor, the improvement comprising combustion chambers in said grid from 1 to 6inches wide and of a length equivalent to the thickness of said grid and interference means provided in said chambers, the fuel and air being introduced into said chambers where they are mixed with the aid of said interference means and combusted within said fluidized bed of particles just above said grid.



3,925,025
RING-FLANGED SLIP-JOINT FOR A REACTOR SYSTEM

Arthur R. Greenwood, Niles; Walter W. Heinze, Chicago; Edward Schnitta, Bensenville, and Frank H. Andrejasich, Summit, all of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Apr. 20, 1973, Ser. No. 356,253
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] B01J *8/12*
U.S. Cl. 23—288 G **3 Claims**



1. A catalytic reactor system providing contact of a reactant stream with catalyst particles movable through said system via gravity flow, which system comprises, in combination:
a. an elongated, vertically-disposed reaction chamber containing;
b. a tubular-form, catalyst-retaining screen, coaxially distended substantially the entire length of said chamber, having (i) a nominal internal cross-sectional area less than said chamber to provide a reactant annulus, and (ii) a first ring flange face immovably connected to the lower peripheral extremity of said catalyst-retaining screen;
c. a tubular-form, perforated centerpipe, coaxially distended substantially the entire length of said chamber, and having a nominal cross-sectional area less than said catalyst-retaining screen to provide an annular catalyst-holding zone;
d. a tubular-form, catalyst-retaining screen support member attached at its lower peripheral extremity to a bottom portion of said chamber, and having a second ring flange face immovably connected to its upper peripheral extremity and in slidable contact with said first ring-flange face; and,
e. a flexible ribbon seal immovably connected to the inner peripheral edge of said first ring-flange face extending

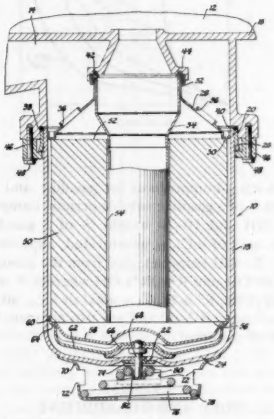
downwardly therefrom to contact said second ring-flange face.

3,925,026

SPRING LOADED CATALYTIC CONVERTER WITH EXTERNALLY MOUNTED SPRING

Martin L. Bray, Flint; Edward N. Cole, Bloomfield Hills, and James A. Haggart, Jr., Davison, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 20, 1974, Ser. No. 498,261
Int. Cl.[2] B01J 8/00; F01N 3/15
U.S. Cl. 23—288 FC 1 Claim



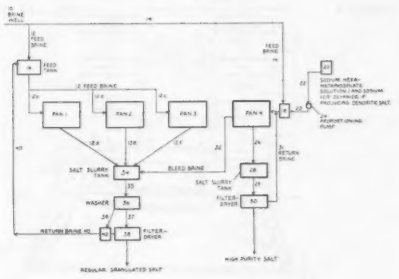
1. A catalytic converter for an engine exhaust system comprising, in combination: a generally cylindrical housing having an axially central inlet and an outlet at one end thereof for exhaust gas flow, a peripheral catalyst element seat at the one end thereof and an axially central opening at the other end thereof;; a generally cylindrical monolithic catalyst element having one axial end positioned against the catalyst element seat, another axial end and a central axial opening therethrough extending between the axial ends and aligned with the housing inlet for conducting exhaust gases from the one axial end to the other; a flow-reversing baffle having a circumferential rim in sealing contact with the other axial end of the catalyst element, the baffle being effective to direct exhaust gas flow from the catalyst element opening radially outward and back through the catalyst element to the outlet; ported spring retaining means fixed to the other end of the housing outside the housing opening; spring means positioned in the spring retaining means for cooling by atmospheric air; and a load-bearing member positioned between the flow-reversing baffle and the other end of the housing, the load-bearing member having a peripheral rim positioned against the peripheral rim of the flow-reversing baffle and a centrally positioned finger projecting out of the housing in slidable sealing engagement with the housing through the housing opening into engagement with the spring means, whereby the force of the spring means is transmitted through the peripheral rims of the load-bearing member and flow-reversing baffle to the catalyst element to retain it firmly against the catalyst element seat, the load-bearing member being otherwise spaced from the flow-reversing baffle for minimum thermal contact therewith, whereby the flow-reversing baffle protects the load-bearing member from the hot exhaust gases.

3,925,027

PROCESS FOR PRODUCING SALT HAVING A REDUCED CALCIUM SULFATE CONTENT

Howard W. Fiedelman, Woodstock, Ill., assignor to Morton-Norwich Products, Inc., Chicago, Ill.

Division of Ser. No. 480,615, June 19, 1974. This application Mar. 3, 1975, Ser. No. 554,649
Int. Cl.[2] C01D 3/06, 3/16; B01D 9/02
U.S. Cl. 23—296 3 Claims



1. An improved process for producing cubic crystalline salt in a multiple effect evaporator system which comprises continuously feeding a raw sodium chloride brine containing dissolved calcium sulfate into an evaporating and crystallizing chamber, evaporating and concentrating said brine at a temperature below about 220°F. and at reduced pressure in the presence of an additive consisting of from about 5 to about 500 parts per million sodium hexametaphosphate to crystallize sodium chloride from said brine, concomitantly bleeding brine from said evaporating chamber in an amount of from 45% to 70% of the brine feed, concomitantly withdrawing and recovering solid sodium chloride having a reduced calcium sulfate content of not more than about 30 parts per million of calcium expressed as calcium from said evaporating chamber, directing said bleed brine containing an enriched dissolved calcium sulfate content to a separate evaporating and crystallizing chamber, concentrating said bleed brine to crystallize sodium chloride therefrom, and recovering the sodium chloride.

3,925,028

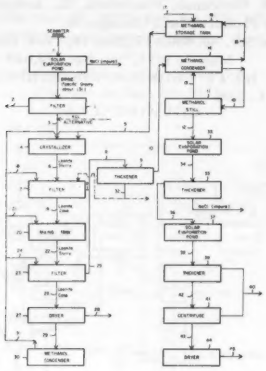
TREATMENT OF SEAWATER BRINES WITH AN ALCOHOL TO RECOVER A FERTILIZER QUALITY DOUBLE SALT

José Antonio Fernández Lozano, Apartado de Correos No. 4526, Puerto La Cruz; Edo. Anzoatequi, Venezuela

Filed Dec. 26, 1972, Ser. No. 318,600
Int. Cl.[2] B01D 9/00; C13K 1/10
U.S. Cl. 23—298 5 Claims

1. A process for the recovery of potassium, magnesium and sulfate from seawater brine in the form of potassium sulfate magnesium sulfate double salt of fertilizer quality, substantially free of sodium chloride, sodium sulfate and other salts, comprising the steps of: (a) Concentrating seawater to a density between about 1.26 and about 1.315 specific gravity; (b) Adding to the said concentrated seawater brine methanol or ethanol at ambient temperature; (c) Agitating the mixture of said seawater brine and methanol or ethanol for a short residence time of about 10 minutes, whereby potassium sulfate magnesium sulfate double salt is formed; (d) Separating the said salt from the liquid phase by filtrations washing and drying the said salt; (e) Conveying the methanol or ethanol vapors from the dryer to a condenser and recycling the condensed methanol or ethanol back to the process; and (f) Conveying the filtrates and washings to a thickener removing the salt formed from the said thickener, removing from the top of the said thickener the clear solution and conveying it to a

distillation column and conveying the methanol or ethanol vapors from the said distillation column to a condenser and



recycling the condensed methanol or ethanol in the process for recovering new amount of the said potassium sulfate magnesium sulfate double salt.

3,925,029

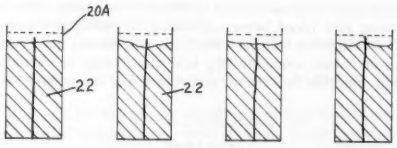
METHOD AND COMPOSITION FOR CANDLE MAKING

William W. Wilson, P.O. Box 36, Norwich, Ohio 43767

Filed Aug. 14, 1973, Ser. No. 388,134

Int. Cl.[2] C10L *5/00*

U.S. Cl. 44—7.5 **21 Claims**



19. A molded, single pour, paraffin wax candle article having a volume of between one ounce and 100 ounces made by a process comprising the steps of heating a batch of paraffin wax having a melting point between 110°F to 155°F to a predetermined temperature between at least 180°F and 300°F; subsequently adding to the molten batch at a given temperature between 180°F and 300°F at least 0.05 to 1.0 percent by weight of a naturally occurring resinoid compound selected from a group consisting of myrrh, galdanum, opponax, labdanium, benzoin, castorium, oakmoss, olibanum, styrax, balsam tolu and balsam peru which is dissolved in a carrier that is at least partially soluble in the wax with agitation to achieve substantially complete mixing of the resinoid compound in the batch; pouring said heated wax composition into suitable molds at an ambient temperature which allows said wax to cool and subsequently crystallize in said molds; and wherein the time lapse between adding said resinoid compound to the batch and the beginning of the crystallization of the wax composition in the mold is at least greater than approximately 30 minutes and no longer than approximately 8 hours, said article being characterized by the absence of a substantial shrink cavity, by a substantial reduction of density as compared to a wax composition not containing a resinoid compound added thereto in accordance with the process described and the visual appearance of spherical inclusions.

3,925,030

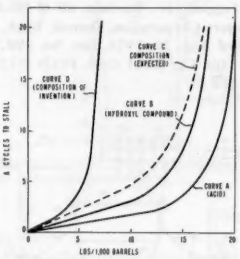
ANTI-ICING COMPOSITION

Bruce Hollis Garth, Newark, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Oct. 6, 1972, Ser. No. 295,660

Int. Cl.[2] C10L *1/02*

U.S. Cl. 44—56 **14 Claims**



1. An anti-icing composition for gasoline and comprising 30–90 weight % of a gasoline soluble organic compound of the formula Z—OH and 10–70 weight % of a gasoline soluble dimer-trimer acid of a C_{16-18} unsaturated, aliphatic monocarboxylic acid, Z—OH being selected from the group consisting of ROH, HOR^1OH and $R^2(OR^3)_nOH$ wherein R is C_{4-18} alkyl, R^1 is C_{6-10} alkylene, R^2 is H, C_{1-18} alkyl or C_{1-12} alkyl(phenyl), R^3 is C_{2-3} alkylene, *n* is 2–60 and any two adjacent OR^3 groups are the same or different.

3,925,031

FUEL AND OIL ADDITIVE

Eugenio G. Villacampa, Av. Morelos No. 31-203, Mexico 1, D.F., Mexico

Filed July 23, 1970, Ser. No. 57,835

Int. Cl.[2] C10L *1/18*

U.S. Cl. 44—56 **5 Claims**

1. A liquid composition of matter comprising:
16 to 19.5 weight percent naphthalene,
6 to 8.7 weight percent camphor,
28 to 42 weight percent of a gasoline fraction,
36 to 45 weight percent toluene,
and 1.8 to 3.0 weight percent benzyl alcohol.

3,925,032

CONTROL OF LIQUID DISSEMINATION

Desmond Wilfrid John Osmond, Windsor; Norman Douglas Patrick Smith, and Frederick Andrew Waite, both of Farnham Common, all of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 818,249, April 22, 1969, which is a continuation-in-part of Ser. No. 786,629, Dec. 24, 1968, abandoned, which is a continuation-in-part of Ser. No. 751,992, Aug. 12, 1968, abandoned. This application Aug. 2, 1971, Ser. No. 168,412

Claims priority, application United Kingdom, May 13, 1971, 14641/71; Apr. 11, 1968, 17544/68

Int. Cl. C10l *1/16*

U.S. Cl. 44—62 **10 Claims**

1. A free-flowing liquid hydrocarbon gas turbine engine aircraft fuel of flash point at least 90°F. having a reduced tendency to particulate dissemination on being subjected to shock, the fuel containing dissolved therein a polymer which is soluble in said fuel and comprises an alkylated polystyrene prepared by the addition polymerization of an alkyl styrene, the polymer having a viscosity average molecular weight greater than 10^6 or of intrinsic viscosity greater than 2.5 dls/gm. and in a concentration such that there is molecular

overlap of the polymer molecules in the liquid and the concentration being between 0.1 and 2 percent by weight.

3,925,033

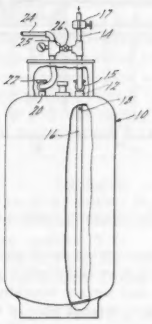
COMBUSTIBLE GAS SYSTEM AND METHOD

Frederick W. Mayo, Livonia, Mich., assignor to N.R.G. Equipment Corporation, Livonia, Mich.

Filed May 23, 1974, Ser. No. 472,601

Int. Cl.[2] C10J *1/20*

U.S. Cl. 48—144 **8 Claims**



5. A combustible gas system including a pressure vessel having an outlet at the top and having a main inlet and a restricted gas delivery inlet connected to said main inlet and opening into the vessel near the top, a dip tube also interconnected with said main inlet and leading to a discharge opening below the level of liquid in the vessel, and a quantity of a liquid in the vessel of relatively higher heat value than said gas, the level of said liquid being below said restricted gas delivery inlet, whereby when gas is delivered simultaneously to said restricted gas delivery inlet and dip tube it is subdivided and one portion bubbled through the liquid and then combined with gas delivered to the space above the liquid for discharge therewith through the outlet.

3,925,034

RESIN BONDED GRINDING WHEEL CONTAINING GAS-FILLED THERMOPLASTIC RESIN BEADS AND METHOD OF MAKING IT

Leo A. Anna, Chardon, and Kenneth C. Dixon, Shaker Heights, both of Ohio, assignors to Research Abrasive Products, Inc., Willoughby, Ohio

Continuation-in-part of Ser. No. 359,737, May 14, 1973, abandoned. This application Dec. 5, 1974, Ser. No. 529,944

Int. Cl.[2] B24D *3/32*

U.S. Cl. 51—296 **25 Claims**

1. A process of the character described comprising reacting epichlorohydrin with bisphenol A to provide a liquid condensation product with an epoxide equivalent of at least 180 and a molecular weight of about 350 to about 400, mixing said condensation product with an aromatic diamine curing agent to form an epoxy resin binder, mixing one part of said epoxy resin binder with about 5 to about 7 parts by weight of aluminum oxide having a particle size from about 36 grit to about 80 grit, with about 10 to 30 parts by weight of mica and with gas-filled polystyrene beads with a diameter from 0.05 to 0.2 inch and a density from about 1.5 to 10 pounds per cubic foot to form a composition containing at least 50 percent by volume of said aluminum oxide and from about 10 to 30 percent by volume of said polystyrene, and heating said composition to a temperature not in excess of 350°F. for at least several hours to harden and set the same.

3,925,035

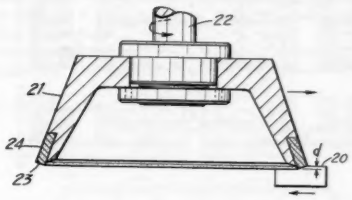
GRAPHITE CONTAINING METAL BONDED DIAMOND ABRASIVE WHEELS

Paul P. Keat, Holden, Mass., assignor to Norton Company, Worcester, Mass.

Continuation-in-part of Ser. No. 227,867, Feb. 22, 1972, abandoned, which is a continuation-in-part of Ser. No. 124,047, March 15, 1971, abandoned. This application Jan. 12, 1973, Ser. No. 323,244

Int. Cl. C04b *31/16;* **C09c** *1/68;* **C23c** *5/00*

U.S. Cl. 51—309 **5 Claims**



1. A cup-type dry grinding wheel having an abrasive section consisting of resin bond type diamond abrasive grains bonded in a metal matrix having a melting point above 300°C, said metal matrix including a filler selected from the group consisting of particulate polytetrafluoroethylene, graphite, hexagonal boron nitride, molybdenum disulfide, and mixtures thereof in the amount of from 15 to 50%, by volume of the bond, said filler having a particle size of between 1 micron and 200 microns, the smaller size filler being present at the lower concentrations of filler, the larger size filler being present at the higher filler concentrations, said diamond abrasive grit being defined by one of the following lists (a), and (b) of characteristics: (a) synthetic multicrystalline diamond having an irregular surface and a friability index F, for grit sizes of 130 and coarser equal to or less than $0.0052s^2$, and equal to or less than $1.07s^{0.9}$, for grit sizes finer than 130, wherein s is the arithmetic average of the number designations of the U.S. Standard sieve series screens used to obtain a sized sample of the diamond, and (b) natural monocrystalline diamond with a friability index of less than $11.3s^{0.43}$ and is selected from a population having a bulk density of 1.7 or less in the 140/170 grit size and 1.6 or less in the 200/230 grit size as measured by the American National Standards Institute method.

3,925,036

STAGE DESIGN

John Shacter, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Mar. 23, 1951, Ser. No. 217,116

Int. Cl.[2] B01D *13/00*

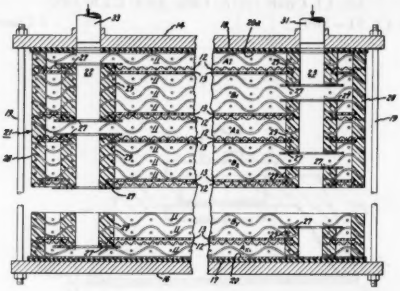
U.S. Cl. 55—158 **2 Claims**

1. A method of cycling gases through a plurality of diffusion stages comprising the steps of admitting the diffused gases from a first diffusion stage into an axial compressor, simultaneously admitting the undiffused gases from a second diffusion stage into an intermediate pressure zone of said compressor corresponding in pressure to the pressure of said undiffused gases, and then admitting the resulting compressed mixture of diffused and undiffused gases into a third diffusion stage.

3,925,037
HIGH PRESSURE MEMBRANE PACKAGE CONSTRUCTION

William J. Ward, III, Schenectady, and William I. Foss, Burnt Hills, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 4, 1974, Ser. No. 439,431
Int. Cl.² B01D 13/00
U.S. Cl. 55—158 8 Claims



6. In a packaged membrane system in which (a) a plurality of spaced membrane assemblies are disposed is substantially parallel surface-to-surface array to define both a first group of flow volumes and a second group of flow volumes alternating between said first group, (b) spacing means for the membrane assemblies is located in each of said flow volumes, (c) means are provided for simultaneously defining the periphery of each of said flow volumes and bonding together adjacent membrane assemblies and the spacing means located therebetween to form gastight peripheral walls and (d) means are provided for separate access to and egress from the plurality of flow volumes in said first group of flow volumes and in said second group of flow volumes, said access and egress means comprising a plurality of discontinuous channels, said channels being arranged in a plurality of sets with the channels in each set being in alignment and said channels having gas-tight walls extending transversely between adjacent membrane assemblies, each channel placing a pair of adjacent flow volumes of the same group in flow communication and the gas-tight wall of each channel bonding together the portion of the spacing means embedded therein and the portions of the membrane assemblies located at the far ends of said gas-tight walls, the improvement comprising:

1. each gas-tight wall extending through a hole in each of said membrane assemblies contacting said gas-tight wall, the edges of each of said holes in said membrane assemblies being rigidly embedded in said gas-tight walls.

3,925,038
WATER DEGASSING DEVICE

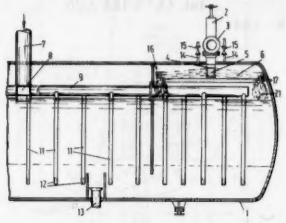
Willem Wiemer, Delden, and Mattheus Besier, Hengelo, both of Netherlands, assignors to B. V. Koninklijke Machinefabriek, Hengelo, Netherlands

Filed Mar. 6, 1973, Ser. No. 338,645
Claims priority, application Netherlands, Mar. 14, 1972, 7203333
Int. Cl.² B01D 19/00
U.S. Cl. 55—159 7 Claims

1. A device for degassing water such as boiler feed water, comprising in combination:

a closed vessel having steam supply means for supplying pressurized steam and including a steam inlet conduit extending into said vessel and a steam distribution manifold presenting steam discharge openings adjacent the bottom of the vessel to discharge steam well below the surface of a body of water contained in the vessel whereby the body of water remains in relatively quiescent state, said vessel having vent means in the top region thereof for venting gasses while maintaining the interior of said vessel under superatmospheric pressure, said vessel having a water discharge conduit for maintaining said surface of the body of water within the upper region of said vessel;

supply means for delivering water under pressure into said vessel and including a spray nozzle located above said surface and delivering at least one high velocity jet spray



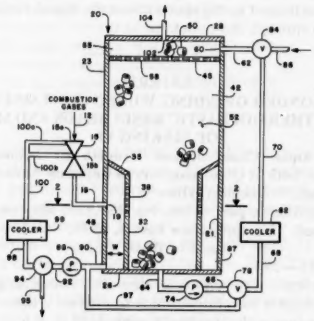
curtain in generally horizontal fashion above said surface; and

grating means for intercepting said high velocity spray curtain and directing it in an undisturbed, gravity fall rainfall-like fashion onto said surface whereby minimally to disturb said relatively quiescent state of the body of water, said grating means comprising a plurality of generally vertical surfaces disposed in horizontally spaced and in ascending overlapping relation in the direction of said jet spray curtain.

3,925,039
SYSTEM FOR TREATING FLUE GAS

Donald L. Ziegler, Golden, Colo., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Nov. 18, 1974, Ser. No. 525,042
Int. Cl.² B01D 47/10, 47/14, 47/16
U.S. Cl. 55—223 7 Claims



1. A system for treating flue gas containing radioactive contaminants comprising means for mixing a cooling liquid with said flue gas, an elongated housing having a bottom wall and an interior cylindrical wall at a lower portion thereof, a hollow cylindrical wall member coaxially disposed within said housing at a lower portion thereof connected with said housing bottom wall and spaced from said interior cylindrical wall of said housing forming therewith about the circumference of said housing a narrow annular liquid-retaining chamber, a scrub bed of packing elements within said housing separate from said annular chamber, a conduit interconnecting said mixing means and said interior cylindrical wall having an inlet

portion to said housing disposed tangentially to said interior wall of the housing for delivering said mixed flue gas and said cooling liquid containing entrapped particles from said mixing means and tangentially feeding into said housing, apertured wall means within the confines of said housing intermediate said scrub bed and said annular chamber and above said annular liquid retaining chamber for passing undissolved flue gas from said annular chamber to said scrub bed while inhibiting passage of said packing elements from said scrub bed into said annular chamber, a conduit connected to the upper portion of said housing for removing flue gas from the upper portion of said housing subsequent to passage through said bed, means for distributing scrub liquid at an upper portion of said scrub bed in countercurrent flow to said flue gas to mix with said flue gas and pass to a lower portion of said scrub bed, means for recycling said scrub liquid from said lower portion of said scrub bed to said distribution means, and means connected with a lower portion of said narrow annular liquid-retaining chamber for recycling cooling liquid from said annular chamber to said mixing means.

3,925,040

GAS SCRUBBING PLANT

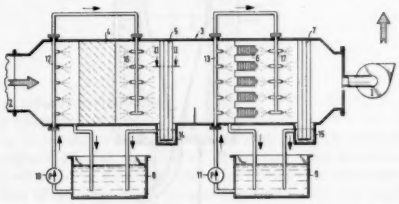
Volker Fattinger, Arlesheim, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 9, 1974, Ser. No. 468,786

Claims priority, application Switzerland, May 14, 1973, 6808/73

Int. Cl.² B01D *47/00*

U.S. Cl. 55—257 **8 Claims**



1. A gas scrubbing plant having a gas inlet and gas outlet and further comprising at least one scrubbing station upstream of at least one drop trap for separation of scrubbing liquid, each of said at least one drop trap comprising a plurality of vertical plates extending substantially parallel to one another and defining horizontal gas flow passages therebetween, said plates each having in a horizontal section a zig-zag configuration and each said passage having at least two angled bends therein;

said plates being shaped to form a pocket on the outer side of each bend extending on both sides of the corner of the bend and substantially over the entire height of the respective plate and being positioned prior to each bend such that the passage defined therebetween opens into said pocket for at least partially guiding the gas flow into the associated pocket;

the angle of the first of said bends being greater than the angle of the second of said bends immediately down stream of it, said angles being defined by the juncture of the respective center-lines of the flow passages prior to and after said bends; and

the pocket formed in at least a first of said bends in each passage having a horizontal cross-sectional area of at least 8% of the area of a parallelogram associated with said first bend, the parallelogram being defined by four horizontal lines with first and second of said lines being parallel to the center-line of the flow passage immediately prior to said first bend and touching respectively the inner surface of the plate forming said pocket and the inner surface of the other plate defining the passage immediately before said first bend, and with third and fourth of said lines parallel to the center-line of the flow passage immediately after said first bend and touching respectively the inner surface of the plate forming said pocket and the inner surface of the other plate defining the passage immediately after said first bend, and the cross-sectional area of the pocket at said first bend being defined by the inner surface of the plate which forms the pocket at the said first bend and by said first and third lines of said parallelogram which touch the inner surface of the pocket forming plate.

3,925,041

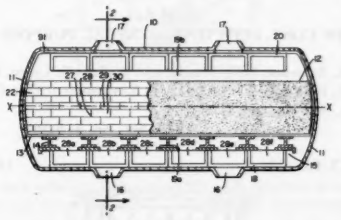
THERMAL SWING GAS ADSORBER

Michael Frederick Patterson, and Kenneth Calvin Kather, both of Buffalo, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 429,278, Dec. 28, 1973, abandoned. This application Dec. 6, 1974, Ser. No. 530,346

Int. Cl.² B01D *53/04*

U.S. Cl. 55—267 **15 Claims**



1. A gas adsorbent vessel comprising: a rigid outer casing, an adsorbent bed within said casing; support means for said adsorbent bed bearing against the casing inner surface and the adsorbent bed outer surface; gas flow passage means extending through the bottom wall and the top wall of said casing; a compressible fibrous layer of thermal insulation material having fiber diameter of less than 20 microns and an uncompressed porosity of greater than 0.95 positioned against the casing inner surface; a multiplicity of rigid preformed sheets of thermal insulation material having permeability of less than 150 ft²/hr-atm based on air at 70°F, being substantially planar and positioned inwardly of and covering said compressible fibrous layer in an end-to-end and side-to-side abutting relationship with transverse gaps between the casing inner surface and outer surface of said preformed sheets not exceeding ½ inch; and means for positioning and outwardly compressing the compressible fibrous layer-rigid preformed sheet assembly against said casing inner surface such that the ratio of the density of the compressible fibrous layer in the compressed state to its density in the uncompressed state is at least 1.5.

3,925,042

APPARATUS FOR TREATING A GAS CURRENT WHICH IS OBTAINED BY COAL GASIFICATION

Jochen Hütgens, Duisburg-Hamborn, and Günter Adomat, Essen, both of Germany, assignors to Gutehoffnungshütte Sterkrade Aktiengesellschaft, Germany

Division of Ser. No. 315,982, Dec. 18, 1972, Pat. No. 3,879,180. This application June 12, 1974, Ser. No. 478,747

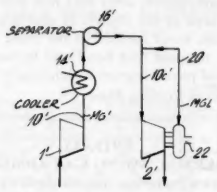
Claims priority, application Germany, Dec. 18, 1971, 2163096

Int. Cl.² B01D *45/00*

U.S. Cl. 55—269 **2 Claims**

1. An apparatus for treating a gas current which is obtained by coal gasification comprising first and second pressure stages, a main gas flow conduit between said first and second stages having cooling means and drip separator means therein

through which the gas separated from the first stage is passed prior to its delivery to the second stage and heating means associated with said conduit downstream of said cooler and separator for heating the gas above the condensation temperature, said heating means comprises a gas conduit connected from said second stage into said conduit for the flow of leakage gas from said second stage back into said conduit to heat the gas flowing therein.

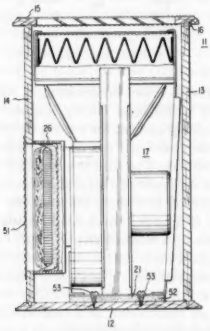


3,925,043

LOW COST, EFFICIENT, GENERAL PURPOSE AIR CLEANER CARTRIDGE

John L. Matrone, Schenectady, and William E. Lyons, Guilderland, both of N.Y., assignors to Environment/One Corporation, Schenectady, N.Y.

Filed Nov. 13, 1973, Ser. No. 415,360
Int. Cl.[2] B01D *50/00*
U.S. Cl. 55—276 **15 Claims**



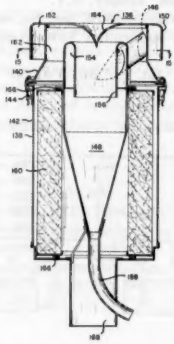
1. A compact, self-supported, low cost, non-enclosed fully operated efficient room air cleaner cartridge for cleaning the room air of homes, offices and the like comprising support means formed by a base member having a relatively flat supporting surface and a plurality of spaced-apart elongated supporting side members secured to and extending from said base member, a high volume air fan having a fan housing with an intake and outlet and supported on the base member, relatively high velocity air discharge conduit means supported by said elongated supporting side members, the high volume fan being disposed on the base member with its outlet discharging into one side of said relatively high velocity air discharge conduit means, means sealing the outlet from the high volume fan to the high velocity air discharge conduit means for preventing the leakage of air therebetween, inlet means connected to the intake of the high volume fan to provide a suction inlet air passageway to the intake of the high volume fan, a coarse, large particle prefilter disposed in the inlet air passageway, a relatively low cost, small particle filter including fine particle filter media, a mounting frame having a closed periperiphy defining a central opening connected to the free ends of said supporting side members mounting said small particle filter transversely across another side of the high velocity air discharge conduit means, said small particle filter being coextensive in size with the central opening in said mounting frame, means sealing said high velocity air discharge conduit means around the central opening in said mounting frame, means sealing the fine small particle filter over the central opening in said mounting frame for preventing leakage of air therebetween whereby air blown into the high velocity air discharge conduit means by the high volume fan is forced through the small particle filter and diffusely discharged exterior of the support means and the cartridge forms a completely self-supported, non-enclosed, fully operational room air cleaner.

3,925,044

AIR FILTER

Peter K. C. Tu, Westerville; Alan H. Brooke, Hudson, both of Ohio, and Frank S. Miller, Norwell, Mass., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Division of Ser. No. 126,046, March 19, 1971, abandoned.
This application Feb. 26, 1973, Ser. No. 335,991
Int. Cl.[2] B01D *50/00*
U.S. Cl. 55—337 **2 Claims**



1. An air filter for removing particulate matter and other impurities from an air stream comprising:

a generally cylindrical casing having a central axis;

an annular inlet region encircling a top section of said casing and defined by a hooded section attached to said casing;

a plurality of inlet passages extending from an outer wall of said top section of said casing to an upper portion of a cyclone separating means centrally disposed within said casing, each said passage being disposed substantially tangentially to said cyclone separating means and downwardly from said annular inlet region;

a cylindrical baffle coaxially aligned with said central axis and disposed within said upper portion of said cyclone separating means to insure said air stream entering through said passages circles about and downwardly into a lower, conically-shaped portion of said cyclone separating means for removal of relatively heavy particles from said air stream;

said baffle having an interior passage therethrough communicating with an area above said cyclone separating means and spaces between said inlet passages for effectively directing said air stream from said cyclone separating means to the outer surface of a filter media enclosed within said casing and surrounding and coaxially aligned with said cyclone separating means, said filter media removing substantially all the remaining particulate matter and impurities from said air stream; and

air guide means including the exterior surface of said lower, conically-shaped portion of said cyclone separating means for effectively directing the now cleansed air out of said filter media and through an outlet passage at the lower end of said casing.

3,925,045
MULTISTAGE CYCLONIC SEPARATOR

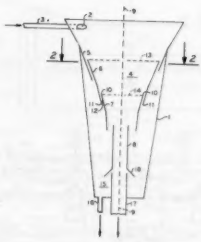
Paul J. Cheng, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 7, 1972, Ser. No. 313,098

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] B01D *45/12*

U.S. Cl. 55—345 **2 Claims**



1. A separator comprising:

a. a chamber;

b. a truncated cone comprised of a plurality of coaxially aligned conical sections of decreasing inlet diameters positioned in superimposed relationship, the upper portion of the uppermost conical section forming the upper portion of said chamber, the lowermost portion of said uppermost conical section and the remaining conical sections being positioned within said chamber, said truncated cone terminating within said chamber at an intermediate point along the vertical axis thereof, each of said conical sections having an inlet diameter greater than its outlet diameter, the lower portion of said uppermost conical section of said truncated cone extending angularly into said chamber and beneath the upper rim of the next lower conical section, each of the lower conical sections positioned within said chamber having its inlet or upper rim positioned within the outlet or lower rim of the next superimposed section to form an annular passageway therebetween, each of said conical sections consisting of an upper conical portion and a lower conical portion, the walls of said upper conical portion being positioned at a first acute angle relative to the vertical axis of said separator and the walls of said lower conical portion being positioned at a second acute angle relative to said axis, said second angle being less than said first angle;

c. a collection section in a lower portion of said chamber in open communication with said passageways;

d. first outlet conduit means opening downwardly from said collection section;

e. second outlet conduit means opening downwardly from said chamber, the upper terminus of said second outlet conduit being positioned within the lower portion of the lowest of said conical sections and in spaced relationship therefrom to form an annulus therebetween; and

f. an inlet conduit means opening tangentially into an upper portion of said uppermost conical section forming the upper portion of said chamber.

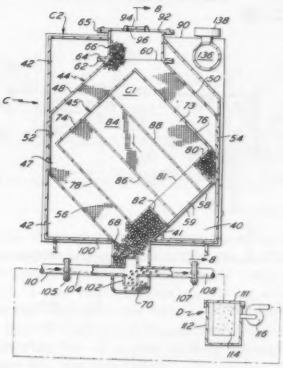
3,925,046
RADIOACTIVE GAS STANDBY TREATMENT APPARATUS WITH HIGH EFFICIENCY RECHARGEABLE CHARCOAL FILTER

Thomas Nelson Hickey, and Ivars Sigurds Spulgis, both of Columbus, Ohio, assignors to CVI Corporation, Columbus, Ohio

Filed Dec. 21, 1972, Ser. No. 317,434

Int. Cl. B01d *50/00*

U.S. Cl. 55—387 **6 Claims**



1. A high efficiency gasketless filter for removal of radioactive isotopes from radioactive contaminated gases comprising a longitudinally extending housing and a plurality of individual filter beds arranged in spaced parallel configuration with respect to each other in said housing and in transverse disposition to the longitudinal direction thereof,

each filter bed comprising (*i*) an outer shell including a pair of spaced parallel perforate side walls transversely positioned across said housing with a peripheral wall portion substantially enclosing said perforate side walls, and (*ii*) an inner shell including a transversely positioned pair of spaced parallel foraminous lateral side walls symmetrically disposed and spaced between said perforate side walls with a marginal rim wall portion enclosing said foraminous lateral side walls, said marginal rim wall portion being further spaced from said peripheral wall portion to define an annular chamber between said inner and outer shells,

means including a closed throat constituting an entrance passageway for admitting radioactive contaminated gas to the interior of each of said inner shells through corresponding peripheral and marginal rim wall portions of each of said filter beds,

an inlet plenum longitudinally extending through said housing and having openings therein registering with the respective throats of said filter beds, and an outlet plenum within said housing communicating with the spaces between adjacent filter beds,

means for filling the annular chamber of each of said filter beds with particulate adsorbent so that the interior of said inner shells and the corresponding throat in communication therewith defines a blind passageway entirely submerged in a cage of particulate adsorbent,

means for drawing the radioactive contaminated gases through the inlet plenum whereby the gas is squeezed laterally in laminar flow disposition through the particulate adsorbent substantially normal to the cages thereof and into the spaces communicating with the outlet plenum, and

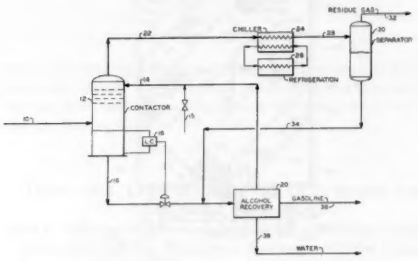
means for removing particulate adsorbent from the annular chamber and said housing when the adsorptive efficacy of the particulate material is expended.

3,925,047

REMOVAL OF MOISTURE FROM A NATURAL GAS STREAM BY CONTACTING WITH A LIQUID DESICCANT-ANTIFREEZE AGENT AND SUBSEQUENTLY CHILLING

Ernest A. Harper, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 101,240, Dec. 24, 1970, abandoned.
This application Dec. 3, 1973, Ser. No. 421,383
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] F25J *3/00, 3/02*
U.S. Cl. 62—20 **7 Claims**



1. A process for reducing the moisture content of a moisture-containing gas stream without substantial moisture removal prior to injecting an antifreeze agent into said gas stream so as to prevent solids formation in said gas stream in a subsequent low temperature processing step, which process comprises: contacting said gas stream which is at an atmospheric temperature in the range 40°–125°F with an aqueous liquid solution containing 51 to 90 weight percent of a low boiling (high vapor pressure) desiccant-antifreeze agent and 49 to 10 weight percent water in an amount and at a temperature in the range 40°–125°F and pressure conditions which are sufficient to (a) absorb a major amount of said moisture from said gas stream into said agent to form a water-agent solution and (b) simultaneously vaporize an amount of said agent into said gas stream removed from said contacting sufficient to prevent said solids formation from residual moisture remaining in said gas stream in a subsequent low temperature processing operation, and chilling said gas stream to a temperature sufficient to condense substantially all of the propane and heavier hydrocarbons therefrom and form a condensate comprising said condensed propane and heavier hydrocarbons, water, and said agent, but at a temperature sufficiently above the eutectic freezing point for the water-agent solution to prevent freezing of the water-agent solution and formation of solids during said chilling.

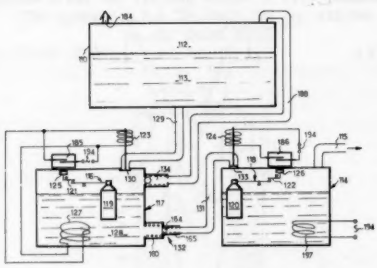
6. A process according to claim **1** comprising the steps of:
a. contacting a natural gas stream countercurrently in a contacting zone with said agent;
b. withdrawing a moisture-enriched stream of said agent from the lower portion of said contacting zone and passing same to an agent recovery zone;
c. withdrawing from the upper portion of said contacting zone a moisture-lean stream of said gas now containing a small amount of said agent and passing same to a chiller zone, said amount of said agent being sufficient to prevent said solids formation in said chiller zone;
d. passing said gas stream from step (c) to a phase separation zone;
e. withdrawing a treated gas stream from said separation zone of step (d) as a product of the process;
f. passing a liquid phase comprising condensed hydrocarbon and said agent from said separation zone of step (d) to said agent recovery zone;
g. withdrawing a stream of condensed hydrocarbon from said agent recovery zone as another product of the process;
h. withdrawing a stream of water from said agent recovery zone;
i. withdrawing a stream comprising recovered liquid desiccant-antifreeze agent from said recovery zone; and
j. returning said recovered agent of step (i) to said contacting zone in step (a) as the agent used therein.

3,925,048

SYSTEM FOR DISTRIBUTING PRESSURIZED GAS FROM A LIQUEFIED GAS SOURCE

Jacques Iung, Pontarlier, France, assignor to Gurtner, S.A., Paris, France

Filed July 24, 1974, Ser. No. 491,505
Claims priority, application France, Aug. 8, 1973, 73.29034
Int. Cl.[2] F17C *7/02*
U.S. Cl. 62—55 **10 Claims**



1. In a system for distributing pressurized gas from a liquefied gas source, supply tank means for containing the gas which is to be distributed in an upper gaseous phase and a lower liquid phase, output container means smaller than said storage tank means for also containing the gas which is to be distributed in an upper gaseous phase and a lower liquid phase, distributing duct means communicating with said output container means at said upper gaseous phase thereof for receiving from said output container means the gas which is to be distributed, intermediate container means smaller than said supply tank means for also containing the gas which is to be distributed in an upper gaseous phase and a lower liquid phase situated in said intermediate container means, supply duct means communicating with a lower portion of said supply tank means and an upper portion of said intermediate container means for supplying liquefied gas from said supply tank means to said intermediate container means, electromagnetic valve means operatively connected with said supply duct means for opening and closing the same to control the supply of liquefied gas from said supply tank means to said intermediate container means, connecting duct means connecting a lower portion of said intermediate container means with an upper portion of said output container means for supplying liquefied gas from said intermediate container means to said output container means, electromagnetic valve means operatively connected with said connecting duct means for controlling the flow of liquefied gas from said intermediate container means to said output container means, a pair of control means respectively situated in said intermediate and output container means and respectively cooperating with the pair of electromagnetic valve means operatively connected with said supply duct means and connecting duct means for respectively opening said valves when the liquid level of the liquid phase reaches a given lower elevation and closing said valves when said liquid level reaches a given upper elevation, a pair of heating means respectively situated in said intermediate and output container means for heating the interiors thereof, and means controlling the heating means of said intermediate

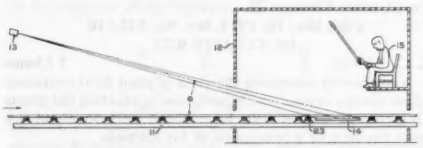
container means when said electromagnetic valve means operatively connected with said supply duct means is closed.

3,925,049

FLAT GLASS INSPECTION SYSTEM AND METHOD

Ronald L. Schwenninger, Cumberland, Md., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 10, 1974, Ser. No. 487,325
Int. Cl.² G01N 21/16
U.S. Cl. 65—29 12 Claims



1. A method for detecting the presence of point type defects having distortion diameters as small as 0.010 inch in flat glass having both point type defects and elongated drawline defects comprising:

orienting the flat glass between a light source and a viewing screen with the drawline defects extending in a longitudinal direction;

continuously projecting light through the glass in a transversely extending band across the full width of glass to be inspected, the rays of said light having an acute angle of incidence with respect to the surface of the glass sufficient to enhance the optical power of point type defects in the glass and to thereby render images cast by small point type defects visually perceptible, the rays of said light also lying in planes that are essentially parallel to the drawline defects and normal to the surface of the glass so as to avoid substantial enhancement of the optical power of the drawline defects;

receiving said light rays on said viewing screen after they have passed through the glass and casting onto said viewing screen images created by optical distortion associated with point type defects, without substantial interference from drawline defect images; and

visually monitoring the viewing screen for images cast thereon.

8. A system for inspecting flat glass for the presence of small point type defects without substantial interference from elongated drawline defects, comprising:

conveyor means for transporting flat glass in a longitudinal direction in a predetermined glass-transporting plane;

light projecting means on one side of said glass-transporting plane for projecting through the glass a band of light across the full transverse width of the area of the glass-transporting plane subject to examination, said projecting means being oriented so as to direct the rays of the band of light toward said glass transporting plane at acute angles thereto sufficient to enhance the optical power of point type defects in the glass and render images cast by the point type defects visually perceptible, and so as to intersect the glass-transporting plane with the rays in substantially parallel, longitudinally extending planes normal to the glass transporting plane; and

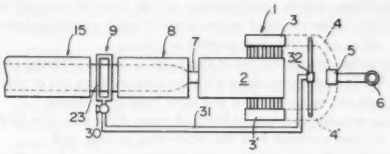
a viewing screen disposed on the other side of the glass-transporting plane and aligned with the path of the projected rays of the band of light so as to receive the defect distortion images cast by point type defects.

3,925,050

PROCESS AND APPARATUS FOR PRODUCING GLASS HAVING METAL OXIDE COATING

Akira Kushihashi; Yutaka Fuziwara, both of Ichihara, and Naotomo Akashi, Maizuru, all of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Feb. 1, 1974, Ser. No. 438,706
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² C03C 17/00
U.S. Cl. 65—60 9 Claims



1. A process for producing glass having a metal oxide coating, which comprises a step of coating the surface of high temperature glass with a heat-decomposable metal compound or its solution, a step of sucking and removing exhaust gases generated in said step from the vicinity of the surface of the glass, and a step of feeding the exhaust gases so removed into a regenerator chamber of a glass melting furnace and then releasing them into the atmosphere.

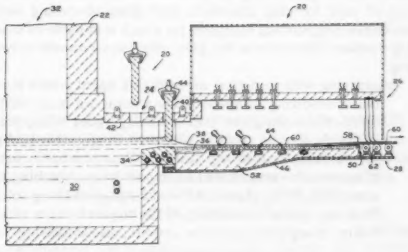
6. An apparatus for producing glass having a metal oxide coating, comprising means for spraying a heat-decomposable metal compound or its solution onto the surface of glass held at a high temperature, exhausting means for sucking and removing exhaust gases generated as a result of spraying, from the vicinity of the surface of the glass, and a conduit for conducting exhaust gases sucked and removed by the exhaust means into a regenerator chamber of a glass melting furnace.

3,925,051

REMOVABLE DAM BARRIER FOR A FLOAT CHAMBER OF A GLASSMAKING APPARATUS

Robert A. Lawhon, Carlisle, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 15, 1974, Ser. No. 514,975
Int. Cl.² C03B 18/02
U.S. Cl. 65—65 A 18 Claims



1. In a glassmaking apparatus for making a continuous glass sheet wherein the glassmaking apparatus is of the type comprising a glass melting furnace for melting glassmaking ingredients; a forming chamber having a bottom bounded by side members and end members for containing a pool of supporting molten metal; and delivery means connecting the glassmaking furnace and the forming chamber for delivering molten glass from the glassmaking furnace onto the pool of supporting molten metal, the improvement comprising:

a plurality of dam barrier sections;

means provided within the chamber at the bottom thereof adjacent a side member for vertically receiving individual ones of said plurality of dam barriers; and

recess means at the bottom of the forming chamber in communication with said receiving means, said recess means provided with means for restricting upward movement of said dam barrier sections.

14. A method of positioning a dam barrier in a forming chamber of a glassmaking apparatus, the forming chamber containing a pool of supporting molten metal wherein the dam barrier provides discrete compartments of molten metal in the forming chamber, comprising the steps of:

providing a plurality of dam barrier sections;

providing within the chamber at the bottom thereof adjacent a side member means for vertically receiving individual ones of the dam barrier sections;

providing recess means at the bottom of the forming chamber in communication with the receiving means to restrict upward movement of the dam barrier sections;

sequentially inserting individual ones of the plurality of dam barrier sections into the receiving means; and

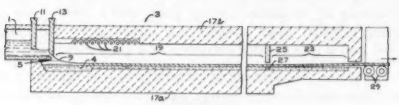
sequentially moving the dam barrier sections from the receiving means into the recess means to provide a dam barrier.

3,925,052

METHOD OF IMPROVING QUALITY OF FLAT GLASS FORMED ON MOLTEN TIN

Merritt J. Hummel, Lower Burrell, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 15, 1974, Ser. No. 514,981
Int. Cl.[2] C03B *18/02*
U.S. Cl. 65—65 A **14 Claims**



1. In a process of forming flat glass which comprises the steps of fusing a glass batch to form molten glass, delivering the molten glass to a pool of molten tin in a forming chamber, attenuating the molten glass along the surface of the tin while cooling to form a continuous sheet of flat glass having a desired, predetermined, final shape and thickness, advancing said sheet of glass along the pool of molten tin and eventually out of said forming chamber, said glass absorbing into its tin-contacting surface stannous tin which is capable of causing top surface distortion in the glass, the improvement comprising:

interfusing with said glass an oxidizing agent which is capable of oxidizing stannous tin to stannic tin in an environment of molten glass, said oxidizing agent being present in the glass in an amount sufficient to maintain said glass substantially free of top surface distortion but is present in an amount insufficient to impart heat-absorbing characteristics to the glass, said oxidizing agent being selected from the group consisting of the higher oxides of chromium, manganese, cerium, arsenic, and antimony.

3,925,053

SLOW ACTING FERTILIZER

Joseph P. Kealy, Winterhaven, Fla., assignor to Swift Chemical Company, Chicago, Ill.

Filed May 14, 1973, Ser. No. 360,099
Int. Cl.[2] C05B *15/00*
U.S. Cl. 71—29 **6 Claims**

1. A highly insoluble granular fertilizer that will simultaneously release all plant food sources slowly and uniformly over a long period of time, which fertilizer contains about ten percent to about 50 percent, by weight, of hydrated calcium sulfate and about 90 percent to about 50 percent of isobutylidene diurea, said calcium sulfate being hydrated and crystallized while in intimate contact with the said isobutylidene diurea so as to produce a homogeneously bound fertilizer having controlled rates of solubility.

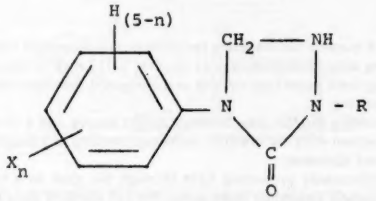
3,925,054

METHOD OF INCREASING THE YIELD OF PLANTS HAVING STORAGE ORGANS BY TREATMENT WITH TRIAZOLIDINONES

John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Dec. 19, 1974, Ser. No. 532,110
Int. Cl.[2] A01N *9/22*
U.S. Cl. 71—92 **7 Claims**

1. A method of increasing the yield of plant food contained in plant storage organs which comprises contacting the plants having storage organs with from about 0.05 to about 4.0 pounds per acre of a compound of the formula



wherein X is selected from the group consisting of lower alkyl, lower alkoxy, lower alkylthio, halogen, lower haloalkyl and nitro; n is an integer from 1 to 3; and R is lower alkyl.

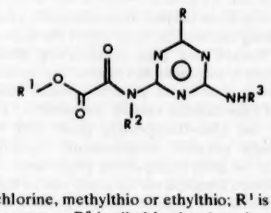
3,925,055

CERTAIN ALKYLOXALYL AMINO SUBSTITUTED S-TRIAZINES HERBICIDES

Alan A. MacDonald, Albany, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 347,296, April 2, 1973, Pat. No. 3,856,793. This application Aug. 23, 1974, Ser. No. 500,202
Int. Cl.[2] A01N *9/22*
U.S. Cl. 71—93 **6 Claims**

1. The method of controlling undesirable vegetation which comprises applying thereto an herbicidal amount of a compound having the formula



where R is chlorine, methylthio or ethylthio; R^1 is alkyl having 1 to 4 carbon atoms; R^2 is alkyl having 1 to 4 carbon atoms; and R^3 is alkyl having 1 to 4 carbon atoms.

3,925,056

HERBICIDAL BIS-UREA AND UREA-CARBAMOYL SULFIDES

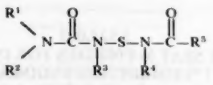
Melancthon S. Brown, deceased, late of Berkeley, Calif., and by Gustave K. Kohn, administrator, Berkeley, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 189,732, Oct. 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 88,212, Nov. 9, 1970, Pat. No. 3,755,437, which is a continuation-in-part of Ser. No. 250,907, May 8, 1972, said Ser. No. 250,907, is a continuation-in-part of Ser. No. 189,732, Oct. 15, 1971. This application Mar. 14, 1974, Ser. No. 450,965

Int. Cl.[2] A01N 9/12

U.S. Cl. 71—98 14 Claims

1. A method for controlling undesirable vegetation which comprises applying thereto an herbicidally effective amount of a compound of the formula



wherein R^1 is hydrogen or alkyl of 1 to 6 carbon atoms; R^2 is alkyl of 1 to 6 carbon atoms or phenyl substituted with up to 4 fluorine, chlorine, bromine, nitro, alkyl of 1 to 5 carbon atoms, alkoxy of 1 to 4 carbon atoms, or up to 1 trifluoromethyl or trichloromethyl; R^3 and R^4 individually are hydrogen, alkyl of 1 to 6 carbon atoms, or phenyl substituted with up to 4 fluorine, chlorine, bromine, nitro, alkyl of 1 to 5 carbon atoms, alkoxy of 1 to 4 carbon atoms, or up to 1 trifluoromethyl or trichloromethyl; and R^5 is $-NR^6R^7$ wherein R^6 is hydrogen or alkyl of 1 to 6 carbon atoms and R^7 is alkyl of 1 to 6 carbon atoms or phenyl substituted with up to 4 fluorine, chlorine, bromine, nitro, alkyl of 1 to 5 carbon atoms, alkoxy of 1 to 4 carbon atoms, or up to 1 trifluoromethyl or trichloromethyl.

3,925,057

PROCESS FOR RECYCLING CHLORINE GAS IN THE CHLORINATION TREATMENT OF IRON OXIDE ORES CONTAINING TITANIUM

Seitaro Fukushima, Saitama, and Kiyoshi Kawahara, Tokyo, both of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed July 11, 1974, Ser. No. 487,802

Claims priority, application Japan, July 12, 1973, 48-78757

Int. Cl.[2] C22B 1/00

U.S. Cl. 75—1 T 13 Claims

1. A process for cycling chlorine gas in the selective chlorination treatment of an iron oxide ore containing titanium for the purpose of obtaining an ore enriched with titanium dioxide which comprises converting chlorine gas introduced into the chlorination treatment process of the iron oxide ore containing titanium to ferric chloride by reaction with the iron oxide contained in the ore in the chlorination process, reconverting said ferric chloride to free chlorine gas by reaction with oxygen in an oxidation process, subjecting the total quantity of the exit gases containing said free chlorine gas from the oxidation process to dust-removing and drying operations, isolating chlorine from said exit gases in a final process, and returning the isolated chlorine to the chlorination process.

3,925,058

METHOD OF RECYCLING SILICON DIOXIDE

Einar Onarheim, Vagsbygd, Norway, assignor to Elkem-Spigerverket A/S, Oslo, Norway

Continuation-in-part of Ser. No. 301,350, Oct. 27, 1972. This application Aug. 12, 1974, Ser. No. 496,404

Claims priority, application Norway, Nov. 8, 1971, 4108/71

Int. Cl.[2] C22B 1/00, 1/08, 7/02; C01B 33/12

U.S. Cl. 75—1 4 Claims

1. The method of recycling silicon dioxide dust to smelting furnaces comprising:

a. recovering silicon dioxide-containing flue dusts from smelting furnaces producing materials rich in silicon;

b. pelletizing said recovered flue dust by admixing it with water in sufficient amount to form cohering pellets of a minimum diameter of at least about 1 cm consisting essentially of said recovered flue dust and water;

c. immediately thereafter and without a previous drying step subjecting the pellets to sintering temperatures of from about 800° to about 1200°C. to form a mechanically strong pellet having a compression strength of at least about 40 kgs.; and

d. introducing the thus formed pellets into a smelting furnace.

3,925,059

FOUNDRY PROCESSES AND METALLURGICAL ADDITION AGENTS THEREFOR

Paul Isidore Fontaine, Solihull, England, and Louis Favillier, Brussels, Belgium, assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Sept. 3, 1974, Ser. No. 502,625

Claims priority, application United Kingdom, Sept. 7, 1973, 42221/73

Int. Cl.[2] C22B 4/00; C21C 7/00; C22B 9/12; B23P 3/00

U.S. Cl. 75—10 R 17 Claims

1. A metal melting process wherein a metallurgical addition agent is added to the melt, in the form of aluminium-containing particles having on the particles coatings comprising at least one of the metals selected from the group consisting of nickel, cobalt and iron, said coatings encapsulating said particles sufficiently to prevent reaction of the aluminium-containing particles with air prior to addition of the agent to the melt.

3,925,060

COMPACT CONTAINING IRON OXIDE AND CARBON AND METHOD FOR ITS USE IN STEELMAKING

Ray A. Bloom and Herbert L. Phillips, both of N. Canton, Ohio, assignors to The Timken Company, Canton, Ohio

Filed Sept. 23, 1974, Ser. No. 508,170

Int. Cl.[2] C21C 5/52; C22B 1/08

U.S. Cl. 75—11 5 Claims

1. A method for melting steel in an electric arc furnace which comprises charging into said furnace scrap having dispersed therein compacts comprising a mixture of essentially entirely unreduced iron oxide, carbon and an air-drying binder, and causing an electrical current to flow between electrodes disposed within the furnace so as to form a molten pool of metal at the bottom of said furnace, the surface level of said pool rising as the scrap melts with the heat from said pool and the electrodes causing said carbon to react with the iron oxide to reduce the same to iron before the surface of the molten pool reaches a compact and melts the same.

3,925,061
STEEL MANUFACTURE
Lars Erik Carlsson, Borlange; Nils Fredrik Grevillius, and Lars Ivar Hellner, both of Karlskoga, all of Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden
Continuation-in-part of Ser. No. 305,681, Nov. 13, 1972, abandoned, which is a continuation of Ser. No. 54,480, July 13, 1970, abandoned. This application Feb. 20, 1973, Ser. No. 333,476
Claims priority, application Sweden, July 15, 1969, 9974/69
Int. Cl.[2] C21C 7/02, 7/06, 7/10
U.S. Cl. 75—58 3 Claims

1. Method of desulphurizing deoxidized melts of steel in charges over 1 ton in a container, which container is provided with a lining which substantially prevents oxygen from leaking in from the lining, and which includes a basic slag line liner at the slag line which comprises adding to the molten steel at least one basic slag-former in the container in order to obtain a high basic molten slag, adding aluminum to the melt and adding misch metal directly into the melt as a desulphurizing agent without substantial contact with the slag and principally at a point of downward movement in the stirring pattern.

3,925,062
PROCESS FOR TREATMENT OF ORES
Jean-Christian Trombe, and Gerard Montel, both of Toulouse, France, assignors to Etablissement Public: Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France
Filed Aug. 2, 1972, Ser. No. 277,206
Claims priority, application France, Aug. 6, 1971, 71.28914
Int. Cl. C22b 61/04, 61/00, 59/00
U.S. Cl. 75—84 13 Claims

1. The process for the treatment of an ore containing at least one of a rare earth element, yttrium and uranium to free said ore thereof and to concentrate said rare earth element, yttrium and uranium, which comprises heating said ore in powder form in an atmosphere consisting essentially of a gaseous halide or oxyhalide of a member of Group V or VI of the Periodic Table other than a fluoride or oxylfluoride of such member, removing effluent gas containing at least one of said rare earth element, yttrium and uranium while leaving the structure of said ore intact, and recovering said rare earth element, yttrium and uranium from said effluent gas by condensation.

3,925,063
ELECTROMAGNETIC STAINLESS STEEL HAVING EXCELLENT MACHINABILITY
Tetsuo Kato, and Isao Sekio, both of Nagoya, Japan, assignors to Daido Seiko Kabushiki Kaisha, Nagoya, Japan
Filed Sept. 18, 1972, Ser. No. 289,883
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] C22C 38/22
U.S. Cl. 75—124 4 Claims

1. An electromagnetic stainless steel having improved machinability consisting essentially of up to 0.05% carbon, 11 to 20 percent chromium, silicon as a magnetic property improving alloy element in an amount up to 6 percent, aluminium as a magnetic property improving alloy element in an amount up to 5 percent, at least one machinability improving alloy element selected from the group consisting of 0.03 to 0.40 percent lead, 0.001 to 0.009 percent calcium and 0.01 to 0.30 percent tellurium, and the balance iron.

3,925,064
HIGH CORROSION FATIGUE STRENGTH STAINLESS STEEL
Akira Takamura, Akashi; Kazutoshi Shimogori; Toshiaki Yamagata, both of Kobe; Masao Sato, Osaka, and Koziro Kitanata, Akashi, all of Japan, assignors to Kobe Steel Ltd., Kobe, Japan
Filed May 31, 1973, Ser. No. 365,714
Int. Cl.[2] C22C 38/44, 38/48, 38/58
U.S. Cl. 75—128 A 1 Claim

1. A high corrosion fatigue strength stainless steel which consists essentially of less than 0.05 wt% carbon, less than 0.03 wt% nitrogen, from 0.1 to 2 wt% silicon, from 0.1 to 4 wt% manganese, from 12 to 14 wt% chromium, from 4 to 6 wt% nickel, from 0.1 to 3 wt% molybdenum and a total of from 0.01 to 1 wt% of at least one element selected from the group consisting of titanium, niobium and tantalum with the balance being essentially iron such that said steel has from 10 – 45% retained austenite.

3,925,065
VALVE SEAT MATERIALS FOR INTERNAL COMBUSTION ENGINES
Makoto Osawa, Tokyo; Yoshitoshi Hagiwara, Niiza; Kunio Kusaka, Yokohama; Takao Kawakita, Itami; Kenya Motoyoshi, Itami, and Nobuhito Kuroishi, Itami, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo and Sumitomo Electric Industries, Ltd., Osaka, both of, Japan
Filed June 22, 1973, Ser. No. 372,612
Int. Cl.[2] C22C 38/30, 38/38, 38/60, 38/44
U.S. Cl. 75—128 R 9 Claims

1. A valve seat material for internal combustion engines, which consists essentially of at least one lubricating material selected from the group consisting of 0.2–10% lead and 0.5–8% glass in a phosphorus- containing precipitation hardened austenitic matrix which is strengthened by the addition of cobalt, said austenitic matrix consisting of 10–35% chromium, 8–45% nickel, 0.1–6.0% molybdenum, 0.2–2.5% carbon, 0.05–0.7% phosphorus, 0.1–20% cobalt and the balance iron except for impurities associated usually with these elements.

3,925,066
GOLD/SILVER ALLOYS
Edward Louis Kohrn, 9 Sunset Drive, Cape Arthur, Severna Park, Md. 21146, and Seymour Globus, 268 Wakely Terrace, Bel Air, Md. 21014
Filed June 19, 1974, Ser. No. 480,890
Int. Cl.[2] C22C 5/06
U.S. Cl. 75—134 C 5 Claims

1. A metal alloy consisting essentially of about 25 to 30 percent, by weight, gold, about 45 to 57 percent, by weight, silver, about 18 to 25 percent, by weight, of copper and 0 to about 5 percent by weight zinc.

3,925,067
HIGH STRENGTH ALUMINUM BASE CASTING ALLOYS POSSESSING IMPROVED MACHINABILITY
Philip R. Sperry, North Haven; Derek E. Tyler, Cheshire, and Leon Butzky, North Haven, all of Conn., assignors to Swiss Aluminium Limited, Chippis, Switzerland
Filed Nov. 4, 1974, Ser. No. 520,412
Int. Cl.[2] C22C 21/16
U.S. Cl. 75—142 8 Claims

1. An aluminum base casting alloy possessing improved machinability consisting essentially of from about 3.5 to about 6.0% copper, from about 0.5 to 3.0% silver, up to about 1% manganese, from about 0.15 to about 0.90% magnesium, up to about 0.20% silicon, up to about 0.20% iron, from about 0.4 to about 0.7% bismuth, from about 0.4 to about 0.7% lead and the remainder aluminum.

3,925,068

PREPARATION OF ALLOYS

Ronald A. Guidotti, Reno, Nev., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Sept. 5, 1974, Ser. No. 503,536

Int. Cl.² C22C *27/02*; **C22B** *34/22*, *34/24*

U.S. Cl. 75—174 **1 Claim**

1. A process for preparation of an alloy useful as a steel additive comprising (1) admixing a nitride of tantalum, niobium or vanadium with an alloying metal consisting of nickel, cobalt or iron, the particle size of the nitride and the alloying metal being reduced to about −50 to −300 mesh prior to admixing, with the ratio of the alloying metal to the nitride ranging from about 0.3 to 3.0, (2) compacting the admixture at a pressure of about 25,000 to 45,000 psi and (3) heating the resulting compact under a vacuum of about 1000 to 10μ Hg at a temperature of about 1200° to 1800°C, but above the liquidus temperature of the desired alloy, for a period of about 2 to 12 hours.

3,925,069

PROCESS FOR PRODUCING PELLETS WITH CEMENT

Shunsaku Shimada, and Tadahiro Inazumi, both of Tokai, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Nov. 30, 1973, Ser. No. 420,568

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C21B *1/24*; **C04B** *7/22*

U.S. Cl. 75—3 **2 Claims**

1. A process for producing pellets, which comprises blending **98** to **60%** by weight of iron ores and **2** to **40%** by weight of a mixture comprising **95** to **15%** by weight of cement and **5** to **85%** by weight of iron containing powders smaller than **100** meshes with addition of **9** to **20%** by weight of water on the basis of the mixture.

3,925,070

BRAZING ALLOY

Arthur T. Cape, Monterey, Calif., assignor to Coast Metals, Inc., Little Ferry, N.J.

Filed Apr. 24, 1974, Ser. No. 463,451

Int. Cl.² C22C *9/05*

U.S. Cl. 75—159 **2 Claims**

1. A brazing alloy of relatively high tensile shear strength at elevated temperatures, said alloy consisting of from about 30% to about 70% copper, from about 0% to about 18% cobalt, from about 3% to about 20% nickel, and from about 1% to about 3% gold, with the remainder essentially all manganese, but not less than about 20% manganese.

3,925,071

HEAT RESISTANT ALLOYS

Subrata Ghosh, Southfield, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed May 20, 1968, Ser. No. 730,226

Int. Cl. C22c *19/00*

U.S. Cl. 75—170 **1 Claim**

1. A temperature resistant metallic alloy consisting essentially of about 65.0 to 85.5 weight per cent nickel and about 7 to 17 weight per cent aluminum which combines to form an alloy composition, said alloy composition having a matrix which is a stable solid solution when at a temperature less than about half of the absolute melting point of said alloy, said matrix when at a temperature above about half and within two-thirds of the absolute melting point of said alloy changing from said solid solution to a supersaturated solid solution such that said matrix due to said supersaturation above said temperature of about half of said absolute melting point forms at least one additional solid state phase in precipitate form to provide strengthening of the alloy matrix above said temperature of about half of said absolute melting point, said alloy including a stable aluminum oxide dispersion phase which will remain upon cooling, said dispersion phase being formed by reacting gaseous oxygen with said additional solid state phase.

3,925,072

NICKEL-CHROMIUM ALLOYS AND CASTING THEREOF

Stuart Walter Ker Shaw, Sutton Coldfield, England, assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Apr. 12, 1974, Ser. No. 460,460

Claims priority, application United Kingdom, Apr. 13, 1973, 17951/73

Int. Cl.² C22C *19/05*

U.S. Cl. 75—171 **7 Claims**

1. A cast alloy consisting essentially of, by weight, from 26 to 35% chromium, from 10 to 25% cobalt, from 0.1 to 0.6% niobium, from 0.3 to 1.5% tungsten, from 1 to 3% tantalum, from 2.5 to 5% titanium, from 1 to 2.5% aluminum, both titanium and aluminum in a total amount from 4.3 to 5.75% with the provisos that the ratio of titanium to aluminum is from 1.4:1 to 4:1 by weight and that the sum

$$5[\%Nb + \tfrac{1}{2}(\%Ta)] + 6(\%Ti + \%Al) + \tfrac{2}{3}(\%Cr)$$

is from 54.5 to 61.3, from 0.05 to 0.15% carbon, from 0.02 to 0.5% zirconium, from 0.002 to 0.05% boron, from 0 to 2% hafnium, and from 0 to 0.2% in total of yttrium and/or lanthanum, the balance, apart from impurities, being nickel.

3,925,073

GOLD/SILVER ALLOYS

Edward Louis Kohrn, 9 Sunset Drive, Cape Arthur, Severna Park, Md. 21146, and Seymour Globus, 268 Wakely Terrace, Bel Air, Md. 21014

Continuation-in-part of Ser. No. 480,890, June 19, 1974. This application Nov. 26, 1974, Ser. No. 527,189

Int. Cl.² C22C *5/06*

U.S. Cl. 75—173 C **4 Claims**

1. A metal alloy consisting essentially of about 25 to 30 percent by weight gold, about 57 to 71 percent by weight silver, about 3 to 10 percent by weight copper and about 0 to 5 weight percent zinc.

3,925,074

ELECTROPHOTOGRAPHIC ELEMENTS CONTAINING DIELECTRIC RESINS AS BINDERS

John R. Wyhof, Newark, Del., assignor to ICI United States Inc., Wilmington, Del.

Division of Ser. No. 362,540, May 21, 1974, Pat. No. 3,865,789. This application Oct. 10, 1974, Ser. No. 513,889

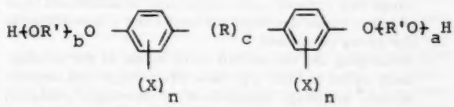
Int. Cl.² G03G *5/04*, *5/08*

U.S. Cl. 96—1.8 **11 Claims**

1. An electrophotographic recording element comprising a base support having coated thereon a layer comprising a photoconductive material and a dielectric resin said resin comprising the reaction product of

a. a dicarboxylic acid or an anhydride thereof, provided that at least 80 mol percent of said acid or anhydride is an alpha unsaturated dicarboxylic acid, an anhydride thereof, an aromatic dicarboxylic acid or an anhydride thereof, and

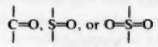
b. a polyol blend comprising a first polyol having the following formula:



wherein

R is an alkylidene group containing from 1 to 4 carbon atoms, a cycloalkylidene group containing 5 or 6 carbon atoms, oxygen, sulfur, or a radical having one of the

following formulas:



c is 0 or 1;

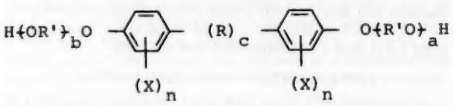
X is halogen or an alkyl radical containing from 1 to 3 carbon atoms;

n is an integer equal to from 0 to 4;

R′ is an alkylene group containing from 2 to 4 carbon atoms or the radical $CH_2CH\phi$; and

a and *b* are integers each of which is equal to at least 1 and the sum of which is equal to about 2, provided that the sum must be equal to at least 2.0

and a second polyol having the following general formula:



wherein R, c, X, R′, and n are as defined above and *a* and *b* are integers each of which is equal to at least 1 and the sum of which is equal to from about 4 to about 16,

wherein the amount of acid or anhydride employed is sufficient to introduce from about 0.8 to about 1.2 carboxyl groups per hydroxyl group in the polyol blend.

3,925,075

PHOTOGRAPHIC DYE DIFFUSION TRANSFER PROCESS USING SILVER SALT TRANSFER FOR REVERSAL

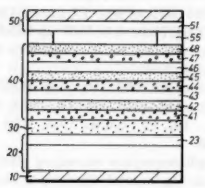
Kaspar Wingender, Leverkusen, and Hans Vetter, Cologne, both of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed May 28, 1974, Ser. No. 473,790

Claims priority, application Germany, June 1, 1973, 2327963

Int. Cl.² G03C *7/00, 5/54, 1/40*

U.S. Cl. 96—3 **7 Claims**



1. A photographic dye diffusion transfer process for the production of positive coloured transfer images, comprising the steps of

a. producing a negative silver image by development in a light-sensitive silver halide emulsion layer which has been exposed imagewise,

b. transferring by means of a silver halide solvent the silver halide that remains undeveloped into an associated layer which contains development nuclei and a non-diffusible dye-giving compound

c. developing the transferred silver halide at the development nuclei to form a positive silver image and simultaneously an image distribution of developer oxidation products

d. causing a condensation reaction between the developer oxidation products produced in this associated layer and the non-diffusible dye-giving compound to release a diffusible dye therefrom, and

e. transferring the diffusible dye to an image receptor layer to form a dye image therein, wherein the improvement comprises

i. the light-sensitive silver halide emulsion layer contains a nondiffusible silver halide developer compound which is incapable of an oxidative condensation reaction with the non-diffusible dye-giving compound,

ii. the associated binder layer which contains development nuclei and the dye-giving compound contains a non-diffusible developer compound which in its oxidized form is capable of undergoing a condensation reaction in the associated layer with the dye-giving compound to release the diffusible preformed dye thereform, and

iii. the development is carried out in the presence of catalytic quantities of a diffusible auxiliary developer.

3,925,076

LIGHT SENSITIVE COMPOSITIONS AND PRODUCTS

Robert A. Heimsch, St. Louis, and Eric T. Reaville, Webster Groves, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 115,727, Feb. 16, 1971, Pat. No. 3,790,389, which is a continuation-in-part of Ser. No. 644,121, June 7, 1967, abandoned. This application Nov. 14, 1973, Ser. No. 415,845

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² G03C *5/00, 1/68;* **B41M** *1/12*

U.S. Cl. 96—35.1 **8 Claims**

1. The process of passing a fluid through a layer in imagewise manner which comprises providing a layer having a latent image comprised of a polymer having aliphatic carbon-to-carbon double bonds and having oxidized portions having chemically bonded oxygen, and non-oxidized portions and applying a fluid to a surface of the layer which fluid selectively penetrates through one of such portions and permitting such fluid to penetrate through such layer selectively.

6. A method of obtaining images which comprises exposing imagewise to light in the presence of oxygen a layer comprising a photosensitizer and a photochemically oxidizable polymer having aliphatic carbon-to-carbon unsaturation, causing addition of oxygen to said polymer forming chemical bonds therewith in exposed areas while otherwise substantially retaining the structure of such polymer, thereby forming a latent image in said layer, and applying a fluid to the surface of the layer which fluid selectively penetrates imagewise through said layer to produce an image.

3,925,077

PHOTORESIST FOR HOLOGRAPHY AND LASER RECORDING WITH BLEACHOUT DYES

James M. Lewis, Aurora, and Raymond W. Newyear, Willoughby, both of Ohio, assignors to Horizons Incorporated, Cleveland, Ohio

Filed Mar. 1, 1974, Ser. No. 447,267

Int. Cl.² G03C *5/00, 5/04, 5/24, 1/68*

U.S. Cl. 96—35.1 **14 Claims**

1. A process for producing a relief image which comprises:

1. preparing a photoresist composition comprising:

at least one N-vinyl monomer;

at least one organic iodine containing compound selected from the group consisting of alkyl iodides, aryl sulfenyl iodides, aryl sulfonyl iodides, α-adiiodotoluene and α-α-atriiodotoluene;

a phenol represented by the formula

where *n* is an integer from 1 to 5 and each Q is selected from the group consisting of hydroxyl, amino, alkyl and allyl;

and at least one bleachout component selected from the group consisting of: (a) substituted anthraquinones, (b) binuclear merocyanines, (c) complex merocyanines, (d) cyanines, and (e) 9-phenyl-fluoren-9-ols;

each of the above constituents being dispersed or dissolved in a resin binder;

and in which the relative amount of said bleachout component is in the range of 2 to 10% by weight of the amount of N-vinyl monomer;

2. depositing a thin film of said composition on a suitable substrate;
3. printing on said thin film by means of a laser beam;
4. then heating said film whereby a relief image is obtained by totally dry means; and
5. then blanket exposing the film to suitable radiation to bleachout any color present in said film.

3,925,078

HIGH FREQUENCY DIODE AND METHOD OF MANUFACTURE

Harry Kroger, Sudbury, and Curtis N. Potier, Holliston, both of Mass., assignors to Sperry Rand Corporation, New York, N.Y.

Division of Ser. No. 223,616, Feb. 4, 1972, Pat. No. 3,816,194. This application Nov. 26, 1973, Ser. No. 419,185

Int. Cl.[2] G03C *5/00;* **B29C** *17/08*

U.S. Cl. 96—36.2 **2 Claims**

1. A method of manufacture affording protection of a first portion of a silicon semiconductor diode body while etching a second portion of said semiconductor body, said first portion projecting from said second portion, comprising the steps of: coating said first and second portions with a continuous temporary chromium layer,

coating said continuous temporary chromium layer with a continuous temporary gold layer,

coating said continuous temporary gold layer overlying said first portion with a fluid photoresist layer,

photographically exposing said fluid photoresist layer and generating a temporary etch-resistant mask,

removing by etching said continuous temporary gold and chromium layers overlying said second portion,

etching said second portion to a predetermined depth,

removing said temporary etch-resistant mask from said first portion, and

removing by etching the remainder of said continuous temporary metal gold and chromium layers from said first portion.

3,925,079

DECORATIVE ARTICLE AND METHOD OF MAKING SAME

Richard W. F. Hager, and Frans C. L. Hager, both of 1464 Wessex Ave., Los Altos, Calif. 94022

Filed June 16, 1972, Ser. No. 263,684

Int. Cl.[2] G03C *5/00*

U.S. Cl. 96—38.1 **7 Claims**

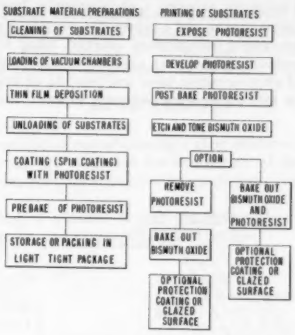
1. A method of making a decorative article comprising

evaporating a layer of image forming material of an oxide of bismuth for a resulting layer of bismuth trioxide of gray-black cubic crystalline form on a substrate,

coating the layered substrate with a photo sensitive material,

exposing the photo sensitive material with a picture,

developing the picture exposed photo sensitive material and etching away the undesired bismuth trioxide of gray-black cubic crystalline form defined by the picture



thereby leaving the image forming bismuth trioxide of gray-black cubic crystalline form on the substate.

3,925,080

MULTI-LAYERED PHOTOSENSITIVE MATERIAL HAVING GLASS SUBSTRATE AND METHOD OF MANUFACTURE

Lambertus Postma, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 24, 1973, Ser. No. 326,514

Claims priority, application Netherlands, Feb. 2, 1972, 7201333

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] G03C *1/80, 1/76*

U.S. Cl. 96—67 **2 Claims**

1. A method of manufacturing a photosensitive material comprising applying to a glass substrate a layer of less than 1 μm of a metal compound capable of pyrolysis to a transparent insoluble metal oxide, heating the resultant moistened glass substrate to a temperature of from about 180°C to 220°C to thereby form an insoluble transparent layer of metal oxide on said glass substrate, applying a layer of a cellulose ester to said layer of metal oxide, saponifying said layer of cellulose oxide to a depth of from 1 to 10 μ and then impregnating the resultant saponified layer with a solution of a photosensitive compound.

2. A photosensitive material produced by the method of claim **1.**

3,925,081

PHOTOGRAPHIC PRODUCTS CONTAINING ANTI-REFLECTION LAYER

Charles K. Chiklis, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 24, 1973, Ser. No. 354,008

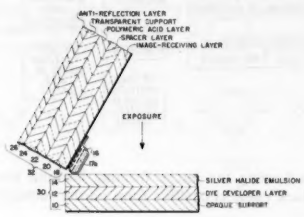
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] G03C *1/76, 3/00, 1/40, 1/84*

U.S. Cl. 96—72 **53 Claims**

1. A photographic product for use in diffusion transfer processes comprising a transparent polyester support carrying on one side thereof an image-receiving layer, the other side of said transparent polyester support carrying an anti-reflection coating, said anti-reflection coating having an index of refraction less than said polyester support and comprising a quarter-wave stratum of a fluorinated polymer and an isocyanate in said stratum or between said stratum and said transparent polyester support, said isocyanate being present in a quantity effective to increase the abrasion resistance of said fluorinated polymer stratum.

23. A photographic film product comprising a first support and a second support, at least one of said supports being a transparent polyester support, a photosensitive layer carried on one of said supports, and a rupturable container releasably holding a processing composition adapted, when distributed between predetermined layers carried by said supports, to develop said photosensitive layer and provide an image viewable through said transparent polyester support, the external



surface of said transparent polyester support carrying an anti-reflection coating, said anti-reflection coating having an index of refraction less than said polyester support and comprising a quarter-wave stratum of a fluorinated polymer and an isocyanate in said stratum or between said stratum and said transparent polyester support, said isocyanate being present in a quantity effective to increase the abrasion resistance of said fluorinated polymer stratum.

3,925,082

MULTICOLOR SCREEN ELEMENT CONTAINING A HYDROPHILIC COLLOID TREATED WITH A BASIC DYE AND ZIRCONIUM ACETATE

Herbert L. Fielding, Wilmington, and Samuel H. Liggero, Wellesley, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 29, 1972, Ser. No. 319,226

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] G03C *1/84*; **G03F** *5/00*

U.S. Cl. 96—76 R **6 Claims**

1. A photographic multicolor screen element which comprises, in combination, a geometrically repetitive plurality of chromatic filter element series; at least one of said chromatic filter element series comprising filter elements comprising a hydrophilic colloid dyed with an aqueous solution of a basic dye and zirconium acetate.

3,925,083

SYNTHETIC SILVER HALIDE EMULSION BINDER

Maurice J. Fitzgerald, Canton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

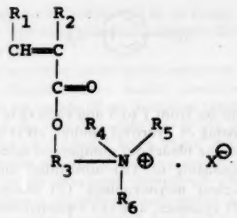
Filed Jan. 2, 1973, Ser. No. 320,452

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] G03C *1/02, 1/72*

U.S. Cl. 96—114 **29 Claims**

1. A photosensitive silver halide emulsion wherein the emulsion binder consists essentially of a water-soluble film-forming copolymer of a first monomer of the formula:



wherein R_1 is hydrogen, a lower alkyl group or a halogen; R_2 is hydrogen, a lower alkyl group, halogen or cyano group; R_3 is a lower alkylene or lower cycloalkylene group and R_4, R_5 and R_6 each is a lower alkyl, or lower cycloalkyl group; or R_3 and/or R_4 and/or R_5 and/or R_6 taken together represent the atoms necessary to complete a 3 to 8-membered heterocyclic ring structure; and X is a salt-forming anion; and

a second monomer which is an acrylamide.

3. The product as defined in claim **1** wherein said silver halide emulsion is a silver iodobromide emulsion.

3,925,084

FOGGED, DIRECT-POSITIVE SILVER HALIDE EMULSION CONTAINING A CYANINE DYE HAVING A PYRAZOLO[1,5-a]BENZIMIDAZOLE NUCLEUS

Akira Sato; Keisuke Shiba, and Masanao Hinata, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Apr. 16, 1973, Ser. No. 351,386

Claims priority, application Japan, Apr. 14, 1972, 47-37445

Int. Cl.[2] G03C *1/36, 1/28*

U.S. Cl. 96—101 **29 Claims**

1. A fogged direct positive silver halide emulsion containing at least one cyanine dye comprising a pyrazolo[1,5-a]benzimidazole nucleus and a cyanine heterocyclic nucleus, which nuclei may be substituted with substituents as are commonly used in the cyanine dye art, in which the carbon atom at the 3-position of the pyrazolo[1,5-a]benzimidazole nucleus is joined to the 2-position or 4-position of the cyanine heterocyclic nucleus, by a methine chain, the carbon atom being joined to the 4-position, however, only when the cyanine heterocyclic nucleus is a quinoline nucleus or a pyridine nucleus, said cyanine dye being present in a concentration effective to provide high sensitivity, maximum image density and providing substantially no color stains.

3,925,085

DIRECT POSITIVE SILVER HALIDE EMULSION

Akira Sato; Akira Ogawa; Keisuke Shiba, and Masanao Hinato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Dec. 19, 1973, Ser. No. 426,145

Claims priority, application Japan, Dec. 19, 1972, 47-127574

Int. Cl.[2] G03C *1/28, 1/16*

U.S. Cl. 96—101 **14 Claims**

1. A direct positive prefogged silver halide emulsion containing at least one dimethinecyanine dye wherein the 3-position of a pyrrolo [2,3b] pyridine nucleus is bonded through a dimethine chain to the 1-, 2-, 3- or 4-position of a cyanine hetero ring nucleus, provided that where the bonding is in the 4-position said cyanine nucleus is a quinoline nucleus or a pyridine nucleus and where the bonding is in the 1- or 3-position said cyanine nucleus is an isoquinoline nucleus, said dimethincyanine dye being present in an amount sufficient to sensitize said emulsion.

3,925,086

AZOTRIAZOLE AND AZOTETRAZOLE ANTIFOG, ANTISTAIN AND SELECTIVE DESENSITIZERS FOR SILVER HALIDE EMULSIONS

Agostino Baldassarri, Savona, and Luigi Cellone, Albissola Marina-Savona, both of Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 15, 1972, Ser. No. 235,011

Claims priority, application Italy, Mar. 16, 1971, 49093/71

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² G03C *1/34*

U.S. Cl. 96—109 **12 Claims**

1. A silver halide photographic emulsion having contacted therewith at least a fog-inhibiting amount of an azotriazole or an azotetrazole.

3,925,087

CORROSION INHIBITION OR PREVENTION WITH INORGANIC-ORGANIC COMPLEXES

Thomas G. Lechner, Lake Elmo, and Michael E. Besse, Eagan, both of Minn., assignors to Economics Laboratory, Inc., St. Paul, Minn.

Filed Apr. 4, 1974, Ser. No. 457,708

Int. Cl.² C08L *91/00;* **C09D** *3/26, 5/08*

U.S. Cl. 106—14 **16 Claims**

1. A corosion-inhibiting composition comprising:

a. about 10 to about 30% by weight of a rust-inhibitive, grease-like concentrate comprising a thixotropic inorganic/organic complex stably dispersed in an essentially inert liquid oily phase in an amount not to exceed 4 parts, per part of said complex, of said essentially inert liquid oily phase, said inorganic-organic complex comprising an over-based alkaline earth organic sulfonate salt, whereby the crystalline structure of the inorganic portion of said complex is platelet and film-forming in character;

b. about 2 to about 10% by weight of a drying oil; said drying oil being miscible in a diluent oil selected from the group consisting of aliphatic hydrocarbon diluents, cycloaliphatic hydrocarbon diluents, aromatic hydrocarbon diluents, and mixtures thereof boiling at temperatures above 150°C.; and

c. from at least 60% by weight to essentially the balance of said composition being a diluent oil selected from the group consisting of aliphatic hydrocarbon diluents, cycloaliphatic hydrocarbon diluents, aromatic hydrocarbon diluents, and mixtures thereof boiling at temperatures above 150°C.

3,925,088

THERMALLY SENSITIVE INK

Joseph T. Leonard, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 20, 1973, Ser. No. 381,119

Int. Cl.² C09D *11/02, 11/16*

U.S. Cl. 106—20 **4 Claims**

1. In a method of printing information with a carbon-based printing composition so that said information is capable of being totally destroyed by burning, the improvement which comprises:

adding an oxidizer to said carbon-based printing composition prior to printing, said oxidizer being selected from the group consisting of sodium nitrate, sodium chlorate, potassium nitrate, magnesium nitrate and ammonium nitrate and said oxidizer being present in an amount at least equal to about the stoichiometric quantity required to oxidize the carbon present in said carbon-based printing composition to carbon dioxide.

3,925,089

METHOD OF MANUFACTURING A MIXTURE FOR TV GLASSES

Mathijs Maria Hendrikus Houben, Eindohoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 24, 1973, Ser. No. 400,402

Claims priority, application Netherlands, Oct. 5, 1972, 7213465

Int. Cl.² C03C *3/04*

U.S. Cl. 106—53 **1 Claim**

1. A method of manufacturing a glass mixture intended for the manufacture of glasses for the screen of the cone of a cathode-ray tube for television image display, comprising the steps of:

providing a mixture having the composition within the range limited as follows in % by weight:

SiO_2	50–75		CaO+MgO<5
Al_2O_3	0.5–6		R_2O>13 (Li_2O +Na_2O+K_2O)
PbO	0–15		B_2O_3<1
BaO	0–15	Combined>8	
ZrO	0–8		
SrO	0–12		

consisting of a pulverulent mixture of feldspar, quartz sand and other glass-forming components, wherein said feldspar has a specific surface larger than 1 sq. m/g and said quartz sand has a specific surface smaller than 0.1 sq. m/g and

producing a glass melt from said mixture substantially free from bubbles and having enhanced dissolution of crystalline constituents.

3,925,090

CELLULAR CEMENT COMPOSITION

James L. Head, P.O. Box 7431, Metairie, La. 70002

Filed Mar. 28, 1974, Ser. No. 455,716

Int. Cl.² C04B *7/35*

U.S. Cl. 106—87 **8 Claims**

1. A method for making cellular cement which comprises vigorously mixing for about two minutes from about 22% to about 26% by weight of water and from about 65% to about 70% by weight of Portland cement, adding from about 5% to about 10% by weight of a styrenated chlorinated polyester precursor mix and mixing vigorously for about five minutes, adding from about 0.04% to about 0.07% by weight of fine aluminum flakes and mixing vigorously for about 30 seconds, and adding from about 0.10% to about 0.15% by weight of an alkali and mixing vigorously to incipient gelation and pouring the product into a form and allowing said product to set.

3,925,091

METHOD AND AN APPARATUS FOR BURNING THE MATERIAL FOR THE MANUFACTURE OF CEMENT

Eiji Yoshida, Yashiro, and Yoshimasa Hayashi, Saitama, both of Japan, assignors to Nihon Cement Company Limited, Tokyo, Japan

Filed Mar. 28, 1975, Ser. No. 455,551

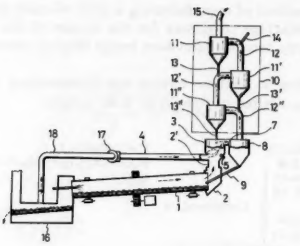
Claims priority, application Japan, Apr. 11, 1973, 48-41034

Int. Cl.² C04B *7/35;* **F26B** *17/00;* **F27B** *15/12, 7/02*

U.S. Cl. 106—100 **11 Claims**

1. In a method of burning cement material using a rotary kiln with the attachment of a suspension preheater equipped with a material burning furnace, said method comprising forming a constriction in the charging-end duct of a rotary kiln, connecting a riser duct formed of a straightly cylindrical upper body portion and a coni-cylindrical lower portion direct onto said constriction at the coni-cylindrical lower portion, said riser duct being provided with a secondary-air intake duct for utilizing air extracted from a clinker cooler and installing in the riser duct a combustion means so positioned as to inject fuel toward the center of the duct, disposing a calcining zone thus set up by said combustion means between the suspension preheater and the kiln, introducing the material preheated by

the suspension preheater into the upper end of the calcining zone, while, at the same time, supplying secondary air for combustion of the fuel into the riser duct in a tangential direction so as to form a swirling flow therein, flowing the exhaust gases from said kiln through the constriction to supply an



ascending stream to the calcining zone, burning the material with the ascending and swirling stream of the resulting combustion gas, separating the calcined material from said exhaust gas of the riser duct in a separator provided through the outlet of exhaust gas in the upper part of the riser duct, and finally charging the material thus treated to the rotary kiln.

3,925,092

JOINT RAMMING CEMENT

Herbert K. Reamey, and Jerry F. Newman, both of Hot Springs, Ark., assignors to Reynolds Metals Company, Richmond, Va.

Division of Ser. No. 411,537, Oct. 31, 1973, Pat. No. 3,871,986. This application Aug. 5, 1974, Ser. No. 494,770

Int. Cl.² C08L *95/00*

U.S. Cl. 106—281 R **4 Claims**

1. A ramming cement adapted for joining carbon bodies, consisting essentially of a mixture of carbonaceous aggregate and from about 13 to about 16.5 percent by weight of petroleum pitch, wherein any course particles of said carbonaceous aggregate, which are at least as large as ⅜ inch size, constitute a minor proportion in relation to the more finely divided material of which about 50% passes 200 mesh screen and said pitch being characterized by having a cube-in-water softening point between about 40° and about 85°C. and having a content of material insoluble in quinoline not greater than about 1 percent.

3,925,093

ADDITION OF PYRIDINIUM C_{12-16} ALKYL BENZENE SULFONATE TO GAMMA-METHACRYLOXYPROPYLTRIS (BETA-METHOXYETHOXY)SILANE

John J. Walsh, and Vincent T. Chuang, both of Marietta, Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed Feb. 12, 1973, Ser. No. 331,980

Int. Cl.² C09K *3/00*

U.S. Cl. 106—287 SB **4 Claims**

1. Gamma-mathacryloxypropyltris (beta-methoxyethoxy) silane containing a small quantity of pyridinium C_{12-16} alkyl benzene sulfonate wherein the amount of pyridinium C_{12-16} alkyl benzene sulfonate which is present, based upon the weight of the gamma-methacryloxypropyltris(beta-methoxyethoxy)silane, is from about **0.75** to about **5** weight per cent.

3,925,094

DYESTUFF PREPARATIONS AND PROCESS FOR THEIR MANUFACTURE

Theodor Papenfuss; Rolf Rehberg, both of Niederhofheim, Taunus, and Ernst Spietschka, Oberauroff, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

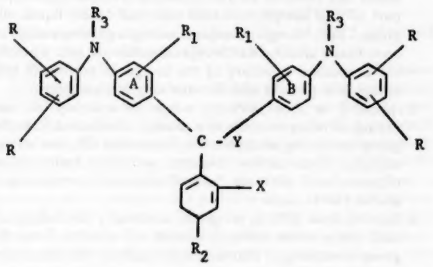
Continuation of Ser. No. 134,472, April 15, 1971, abandoned. This application Apr. 9, 1973, Ser. No. 348,865

Claims priority, application Germany, Apr. 16, 1970, 2018169

Int. Cl.² C09B *57/00*

U.S. Cl. 106—288 Q **5 Claims**

1. A process for making a pigment composition consisting essentially of resins and triphenyl-methane dyestuffs which comprises preparing a solution in an organic amine which is liquid below 50°C. of an acid-precipitatable resin and a triphenylmethane dyestuff of the general formula



in which

R is hydrogen, chlorine, bromine, alkyl, alkoxy, cyano, carboxylic acid ester, carboxamido, nitro, amino, alkylamino, phenylamino, acylamino, substituted phenyl, phenyl or sulfon-amido and two radicals, R in o-position may form together a condensed phenyl ring,

R_1 is hydrogen, methyl or ethyl, and R_1 may be directly bonded to a radical R,

R_2 is hydrogen, chlorine, bromine, amino, phenylamino, or naphthylamino which may be substituted by one or two radicals which have the meaning of R,

R_3 is hydrogen, methyl or ethyl,

X is hydrogen, chlorine, bromine or a radical $-SO_3H$ or $-COOH$

Y is hydroxy,

and X and Y together may be a $-SO_2O$ or $-CO-O$ group and one of the radicals R_3 and Y may also be directly bonded with the ring A or B, one ring being a quinonoidal system, mixing the resulting solution with an aqueous solution of an acid at a temperature between about −10° and +50°C. to precipitate resin-dyestuff particles and recovering the precipitated particles.

3,925,095

FREE-FLOWING DISPERSIBLE INORGANIC PIGMENT OF FILLER COMPOSITIONS CONTAINING HYDROXYALKYLATE ALKYLENE DIAMINES

August Bückmann; Günter Teichmann, both of Krefeld, and Hans Rudolph, Krefeld-Bockum, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 19, 1973, Ser. No. 380,926

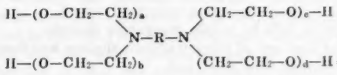
Claims priority, application Germany, Aug. 1, 1972, 2237791

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] C09C *3/08*

U.S. Cl. 106—308 N **5 Claims**

1. A free-flowing, dispersible composition comprising an inorganic pigment or filler selected from the group consisting of titanium dioxide, zinc oxide, zinc sulfide, iron oxide, chromium oxide, cadmium chalcogenide, aluminum oxide, mica, kaolin, calcium carbonate, talcum, silicon dioxide and dolomite and about 0.1 to 3% by weight of the pigment or filler of a hydroxyalkylated alkylene diamine of the formula



(1)

in which

R is an alkylene radical of about two to 15 carbon atoms, *a*, *b*, *c* and *d* are integers from 1 to about 22 and the sum of *a*, *b*, *c* and *d* is about 5 to 25.

3,925,096

METHOD OF PRODUCING RESIN-CONTAINING PIGMENT PREPARATIONS

Otto Karkov, Hojelse Gamle Skole, Lille Skensved, Denmark

Continuation-in-part of Ser. No. 757,107, Sept. 3, 1968, abandoned. This application May 18, 1973, Ser. No. 361,667

Int. Cl.[2] C08J *3/20*; **C09C** *3/10*; **C09D** *17/00*

U.S. Cl. 106—309 **3 Claims**

1. Method of producing a particulate resin-containing pigment preparation, comprising ball-milling an organic solvent-soluble, linear polymer resin in the presence of at least 70% by weight of pigment based on the total weight of resin and pigment, water, and an organic water-immiscible solvent or mixture of solvents being soluble in, but incapable of dissolving the said resin, said solvent or solvents being used in amounts sufficient to be homogeneously taken up by said polymer resin to form a swollen, coherent, non-sticky, soft polymer resin.

3,925,097

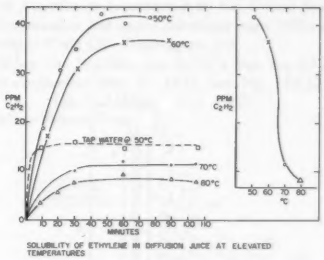
STIMULATION OF SUGAR DIFFUSION FROM PLANT TISSUE WITH THE USE OF ETHYLENE, ETHYLENE PRECURSORS, AND ANALOGS

Arthur H. Freytag, Longmont, and James C. Linden, Loveland, both of Colo., assignors to The Great Western Sugar Company, Denver, Colo.

Filed Nov. 16, 1973, Ser. No. 416,637

Int. Cl. C13d *1/08*

U.S. Cl. 127—44 **20 Claims**



1. A method of stimulating sugar diffusion from plant tissues containing sugar selected from the group consisting of sugar beets, sugar cane, sugar maize and sugar sorghum which comprises contacting the plant tissues with diffusion water in the presence of ethylene.

3,925,098

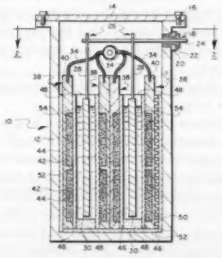
POSITIVE ELECTRODE FOR ELECTRICAL ENERGY STORAGE DEVICE

Richard C. Saunders, Simi, and Laszlo A. Heredy, Canoga Park, both of Calif., assignors to Electric Power Research Institute, Palo Alto, Calif.

Filed Nov. 27, 1974, Ser. No. 527,678

Int. Cl.[2] H01M *35/00*

U.S. Cl. 136—6 LF **20 Claims**

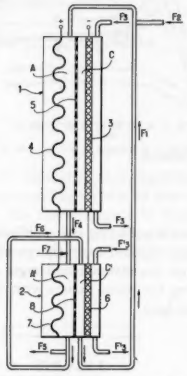


1. In a rechargeable electrical energy storage device comprising a negative electrode containing lithium, a fused salt electrolyte containing lithium ions, and a positive electrode containing at least one selected transition metal chalcogenide, the improvement wherein the positive electrode comprises a porous, compressible felt matrix formed from resilient carbon or graphite fibers, said matrix being impregnated with particles of the selected transition metal chalcogenide.

3,925,099
FUEL CELL WITH A DECARBONATION CYCLE, CONSUMING A MIXED FUEL

Pierre Bono, Morangis; Philippe Demange, Chatenay Malabry; Claudine Leclere, Antony, and Alexis Tissier, St. Michel-sur-Orge, all of France, assignors to Societe Generale de Constructions Electriques et Mecaniques "Alsthom & Cie", Paris, France

Filed Jan. 16, 1975, Ser. No. 541,595
Claims priority, application France, Jan. 28, 1974, 74.02689
Int. Cl.[2] H01M 8/04
U.S. Cl. 136—86 C 8 Claims



1. Method for decarbonation of an alkaline electrolyte of a fuel cell utilizing a carbonaceous fuel and an oxygen-containing oxidant, the electrolyte and fuel being supplied to the anode compartment of the power portion of the fuel cell and the oxidant being fed to the cathode compartment, separated from said anode compartment by a first membrane, of said fuel cell, the electrolyte being decarbonated during operation of the cell, said method comprising the steps of:

withdrawing electrolyte from said anode compartment for decarbonation;

adding to the electrolyte thus withdrawn a material containing formate ions;

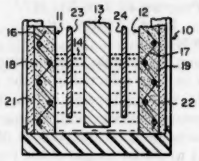
passing the mixture of said electrolyte and said formate ion containing material successively through the anode and cathode compartments of a decarbonation portion of said fuel cell said anode compartment and said cathode compartment separated by a second membrane permitting passage of OH^- ions, carbon dioxide being removed after passage of said mixture through said anode compartment and before passage into said cathode compartment, and returning the decarbonated electrolyte from said decarbonation portion of said fuel cell to said anode compartment of said power portion of said fuel cell,

the amount of said formate ion containing material added to the electrolyte being such that the sum of the formate ion content of the withdrawn electrolyte resulting from the oxidation of said carbonaceous fuel and the formate ion content added as aforesaid to the electrolyte is sufficient to produce coomplete decarbonation of the electrolyte.

3,925,100
METAL/AIR CELLS AND AIR CATHODES FOR USE THEREIN

Edward S. Buzzelli, Export, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 26, 1974, Ser. No. 446,088
Int. Cl. H01m 27/04
U.S. Cl. 136—86 A 7 Claims



1. An air electrode for use in metal/air cells comprising:

A. a hydrophilic layer including the composition comprising:

i. an oxygen absorption/reduction carbon,

ii. 50 to 70% by weight manganese dioxide,

iii. at least one of polytetrafluoroethylene and fluorinated ethylene propylene, and

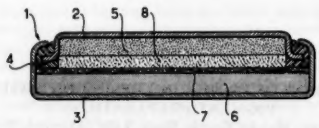
iv. metal fiber current collector integrally molded into said composition to form said layer; and

B. a porous, unsintered, completely fibrillated polytetrafluoroethylene hydrophobic sheet laminated to said hydrophilic layer, wherein said composition includes a silver-mercury catalyst.

3,925,101
ELECTRIC PRIMARY CELL IN WHICH THE POSITIVE ACTIVE MATERIAL IS SILVER CHROMATE

Gerard Lehmann, and Alfred Brych, both of Chasseneuil-du-Poitou, France, assignors to SAFT-Societe des Accumulateurs Fixes et de Traction, Romainville, France

Filed Jan. 7, 1975, Ser. No. 539,184
Claims priority, application France, Feb. 8, 1974, 74.04280
Int. Cl.[2] H01M 6/00
U.S. Cl. 136—100 R 5 Claims

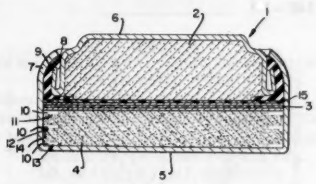


1. In an electric primary cell whose components comprise as positive active material silver chromate, as negative active material an alkaline metal, and as electrolyte a solution of a salt in an aprotic solvent and wherein the said components are enclosed in a casing comprising two parts electrically insulated from each other and containing respectively the negative active material and the positive active material, and said parts each comprising at least a metallic portion acting respectively as the positive and negative terminals of the cell, said cell being characterized in that the metallic portion of the positive part of the casing is made of stainless steel containing at least 11% by weight of chromium.

3,925,102
DIVALENT SILVER OXIDE CELL HAVING A UNIPOTENTIAL DISCHARGE LEVEL

Akiya Kozawa, Middleburg Heights, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed June 25, 1974, Ser. No. 483,014
Int. Cl.[2] H01M *6/12, 4/24*
U.S. Cl. 136—111 **12 Claims**

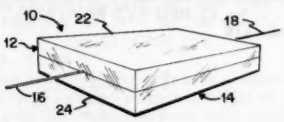


1. In an alkaline silver oxide cell comprising a negative electrode, a positive electrode comprising divalent silver oxide, an electrolyte, and a two-part conductive container comprising an upper section and a cylindrical lower section having an upstanding wall and a closed end; said cylindrical lower section housing the positive electrode, the improvement wherein at least one oxidizable metal strip is interposed between and in electrical and physical contact with said positive electrode and the inner upstanding wall of the cylindrical lower section so that the electrochemical reaction of the oxidizable metal strip in the presence of the electrolyte will produce a substantially unipotential discharge over the useful life of the cell.

3,925,103
RADIATION HARD SOLAR CELL AND ARRAY

Robert L. Russell, Tustin, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Oct. 27, 1972, Ser. No. 301,453
Int. Cl. H01v *1/12;* **H01l** *15/02*
U.S. Cl. 136—202 **13 Claims**



1. A radiation hard solar cell module, comprising:

a pair of solar cells including a primary power generating cell having an active face for receiving solar radiation in a nuclear radiation environment, and a shunt cell having an active face for receiving nuclear radiation in said nuclear radiation environment but shielded from receiving solar radiation in said solar radiation environment;

the response of said shunt cell to nuclear radiation being at least substantially equal to that of said power cell;

first and second terminals for connecting said module to other similar modules to form a solar array;

first means electrically connecting said first terminal to the positive contact of said power cell and the negative contact of said shunt cell; and

second means electrically connecting said second terminal to the negative contact of said power cell and the positive contact of said shunt cell.

11. The method of suppressing the output of a power generating solar cell in a nuclear radiation environment while permitting normal output of the cell in a solar environment which comprises the steps of:

shunting said power cell with a second solar cell having a response to nuclear radiation at least substantially equal to that of the power cell in such a way that the contacts of said shunt cell are reversed relative to said power cell,

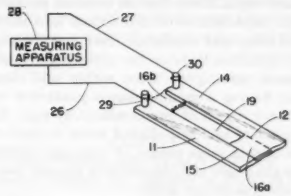
exposing said power cell only to the solar radiation in said solar radiation environment; and

exposing both cells to the nuclear radiation in said nuclear radiation environment.

3,925,104
THERMOCOUPLE TAPE

Ralph D. Thomas, Cleveland, Ohio, assignor to The United States of America as represented by the United States National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Division of Ser. No. 104,885, Jan. 8, 1971, Pat. No. 3,729,343.
This application May 17, 1972, Ser. No. 254,323
Int. Cl.[2] H01L *35/04, 35/28*
U.S. Cl. 136—225 **4 Claims**



1. A thermocouple tape comprising:

an elongated strip of flexible electrically nonconductive material having at least one aperture therein;

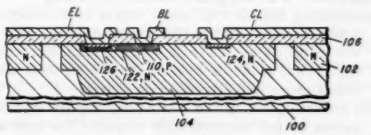
a first strip of a first thermoelectric metal disposed on one side of said tape; and

a second strip of a second thermoelectric metal disposed on said one side of said tape parallel to said first strip, said first and second strips overlapping along the length of said tape except at said aperture, said aperture having a width at least equal in width to said overlapping area whereby at least two longitudinally extending junctions are formed on said tape, the portions of said first and second layers on each side of said junctions and said at least one aperture serving as connecting leads.

3,925,105
PROCESS FOR FABRICATING INTEGRATED CIRCUITS UTILIZING ION IMPLANTATION

Benjamin Johnston Sloan, Jr., Richardson, Tex., assignor to Texas Instruments, Incorporated, Dallas, Tex.

Filed July 2, 1974, Ser. No. 485,200
Int. Cl.[2] H01L *21/265*
U.S. Cl. 148—1.5 **14 Claims**



1. A method of fabricating a semiconductor device including a semiconductor substrate of one conductivity type having semiconductor layer of opposite conductivity type thereon, including the steps of:

a. forming a substantially flat surfaced layer of insulating material on said semiconductor layer;

b. forming a first single mask definition layer on said insulating layer to delineate an inner area within and spaced from a surrounding closed contour area;

c. implanting dopant ions of said one conductivity type through said flat surfaced insulating layer into surface areas of said semiconductor layer beneath said closed contour and inner areas delineated by said masking layer to form a closed contour surface region and an inner region of said one conductivity type in said semiconductor layer, said mask definition layer providing a barrier to implantation of said dopant ions therethrough;

d. covering said first mask layer and inner area with an implantation barrier material layer having at least one aperture therein positionally corresponding to but oversize in relation to said closed contour area, and implanting further dopant ions of said one conductivity type through said insulating layer into said semiconductor layer to extend said closed-contour surface region of said one conductivity type completely through the thickness of said semiconductor layer, said mask definition layer and said implantation barrier material providing a barrier against implantation of said dopant ions therethrough;

e. uncovering said insulating layer and forming a second mask definition layer on the same said insulating layer to delineate self-aligned areas within said closed contour region having a predetermined positional relation with said inner region of one conductivity type, first and second ones of said self-aligned areas located over spaced areas of said inner region of said one conductivity type and a third said self-aligned area located over an area of said semiconductor layer;

f. covering said second self-aligned area with an implantation barrier layer and implanting dopant ions of said opposite conductivity type through said first and third self-aligned areas to form a first doped surface region of said opposite conductivity type in said inner region of one conductivity type and a second doped region of opposite conductivity type in said semiconductor layer; and

g. uncovering said substantially flat surfaced insulating layer.

3,925,106

ION BOMBARDMENT METHOD OF PRODUCING INTEGRATED SEMICONDUCTOR CIRCUIT RESISTORS OF LOW TEMPERATURE COEFFICIENT OF RESISTANCE

San-Mei Ku, and Burton J. Masters, both of Poughkeepsie, N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Dec. 26, 1973, Ser. No. 428,537
Int. Cl. H01l *7/44*
U.S. Cl. 148—1.5 **15 Claims**

1. A method for forming a high resistivity region of a selected sheet resistance and a reduced temperature coefficient of resistance in an integrated circuit comprising

introducing dopant ions into a region of a semiconductor substrate, and additionally bombarding the region with non-dopant ions at a dose which is sufficient to damage the crystal structure but insufficient to form an amorphous phase in the bombarded region,

the concentration of the introduced dopant ions being in excess of the concentration required for said selected sheet resistance in an umbombarded region, but said bombardment producing a resistance higher than the selected resistance, and

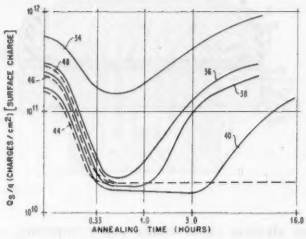
heating at a temperature of from 500°C. to 800°C. for a time sufficient to partially anneal the damage so as to lower the sheet resistance of the region to the selected sheet resistance while the temperature coefficient of resistance is maintained below the temperature coefficient of resistance of said unbombarded region.

3,925,107

METHOD OF STABILIZING MOS DEVICES

Robert A. Gdula, Pleasant Valley; Stanley I. Raider, and Martin Revitz, both of Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 11, 1974, Ser. No. 522,794
Int. Cl.² H01L *21/324*
U.S. Cl. 148—1.5 **8 Claims**



1. A method of fabricating and stabilizing a gate dielectric layer for MOS devices to reduce the fixed oxide charge in the gate dielectric layer without degrading the layer comprising: forming a layer which includes at least a layer of silicon oxide of a thickness less than 500 Angstroms over at least the gate region by thermal oxidation of the monocrystalline silicon device substrate,

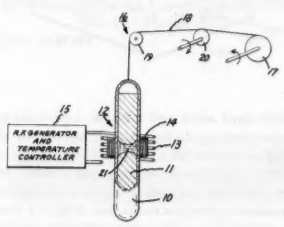
annealing the substrate in an atmosphere of a gas selected from the group consisting of He, Ne, Ar, Kr and Xe, at a temperature of at least 900°C for at least ten minutes.

3,925,108

METHOD FOR PREPARING DECOMPOSABLE MATERIALS WITH CONTROLLED RESISTIVITY

Henry H. Woodbury, Scotia, and Robert S. Lewandowski, Amsterdam, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 92,661, Nov. 25, 1970, abandoned.
This application Dec. 26, 1972, Ser. No. 318,361
Int. Cl. H01l *7/42;* **B01j** *17/08*
U.S. Cl. 156—618 **11 Claims**



1. A method of preparing a body of cadmium telluride of predetermined resistivity comprising

sealing a quantity of cadmium telluride in an evacuated vessel,

melting and cooling said quantity of cadmium telluride within said evacuated vessel to cause the formation of a solid body of said quantity which completely fills the cross section of said vessel while being freely movable therein from the bottom to the top thereof,

lowering said sealed evacuated vessel with said solid body therein through a narrow heated zone to cause a narrow molten zone to be formed in said solid body and to traverse said solid body from the bottom to the top thereof,

said molten zone being confined between adjacent solid portions of said body and the walls of said vessel,

providing said narrow molten zone with heat to maintain the temperature thereof at a predetermined value corresponding to said predetermined resistivity within the range of approximately 1,120°C to 1,220°C,

whereby said quantity of cadmium telluride is formed into a body of said predetermined resistivity.

3,925,109

PRECISE CARBON CONTROL OF FABRICATED STAINLESS STEEL

Roy J. Nilsen, Pittsburgh, Pa., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Jan. 29, 1974, Ser. No. 438,148
Int. Cl.² C23C *11/12*; G21C *3/34*
U.S. Cl. 148—6.35 **1 Claim**

1. A method for controlling the carbon content to a level of about 0.05 weight percent in a fabricated AM-350 stainless steel nuclear reactor fuel rod grid comprising:

a. exposing the said nuclear reactor fuel rod grid to an oxidizing atmosphere of wet hydrogen having a dew point of from −23°F. to −7°F. at a temperature of from 1,880°F. to 1,920°F. for a period of 28 to 40 minutes;

b. replacing said oxidizing atmosphere with dry hydrogen having a dew point of −80°F. or less and maintaining said nuclear reactor fuel rod grid in said dry hydrogen for a period of 10 to 15 minutes at a temperature of 1,880°F. to 1,920°F.; and

c. replacing said dry hydrogen atmosphere with a reducing carbon/oxygen/hydrogen atmosphere containing about 350 ppmv CO and about 200 ppmv H_2O and exhibiting a carbon activity equal to an equilibrium AM-350 carbon concentration of about 0.05 weight percent at about 1,900°F and maintaining said grid at said temperature for about 1 hour.

3,925,110

SUPERPLASTIC ALLOY OF TIN AND ZINC

Robert Joseph Prematta, Hightstown, and Peruvemba Swaminatha Venkatesan, Princeton, both of N.J., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Apr. 25, 1974, Ser. No. 464,010
Int. Cl.² C22F *1/16*
U.S. Cl. 148—11.5 R **5 Claims**

1. A tin-zinc alloy consisting essentially of about 91 percent by weight of tin and about 9 percent by weight of zinc, having an average grain size ranging between 0.001–0.002 mm.

3,925,111

HIGH TENSILE STRENGTH AND STEEL AND METHOD FOR MANUFACTURING SAME

Hiroshi Takechi; Tsuyoshi Kawano, both of Kisarazu; Toshio Hashizume; Kazuo Koyama, both of Kimitsu, and Hiroaki Masui, Chiba, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 28, 1973, Ser. No. 429,274
Claims priority, application Japan, Dec. 31, 1972, 48-2832; Dec. 31, 1972, 48-2833
Int. Cl.² C21D *7/14*
U.S. Cl. 148—12 F **9 Claims**

1. In a method for manufacturing high tensile steel having superior cold workability and toughness wherein an aluminum killed steel slab is heated and hot rolled, the improvement wherein the steel contains 0.04 to 0.35% Ti, 0.005 to 0.15% soluble aluminum, less than 0.008% N, and Ti/C is less than 4, and the steel slab is heated to greater than 1200°C and the hot rolling is finished at a temperature between 730° and 880°C and carried out with more than one pass at a temperature from 980° to 1100°C and a reduction of more than 28%.

3,925,112

SOLDER FLUXES

Arthur Petersen, Sr., Florham Park; Leonard S. Mackowiak, East Hanover, and Daniel Schoenholz, Basking Ridge, all of N.J., assignors to Hercules Chemical Co., Inc., New York, N.Y.

Filed Feb. 19, 1974, Ser. No. 443,877
Int. Cl.² B23K *35/362*
U.S. Cl. 148—25 **7 Claims**

1. A solder flux comprising an aqueous emulsion including an oil phase comprising from about 5 to about 50 parts by weight of a paraffin wax-petrolatum melt, the weight ratio of petrolatum being about 1 to about 2 parts for each part by weight of paraffin wax in said paraffin wax-petrolatum melt, and from about 0.1 to about 50 parts by weight of an emulsifier system comprising an oil soluble admixture of fatty acid esters of sorbitol and ethoxylated fatty acid esters of sorbitol, the weight ratio of fatty acid esters of sorbitol being about 3 to about 6 parts for each part by weight of ethoxylated fatty acid esters of sorbitol in said emulsifier system, and including an aqueous phase comprising from about 2 to about 30 parts by weight of a water soluble hydrazine salt, from about 0.05 to about 5.0 parts by weight of sodium sulfite, and the remainder being deionized water.

3,925,113

QUENCHING OIL COMPOSITION

Dale J. Wilpers, Godfrey, Ill., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 427,204, Dec. 21, 1973, Pat. No. 3,866,603. This application Dec. 9, 1974, Ser. No. 530,647
Int. Cl.² C21D *1/44*
U.S. Cl. 148—29 **4 Claims**

1. A non-staining quenching oil composition consisting essentially of a mineral oil, having a high-heat exchange rate as measured by a magnetic quenchometer time of from about 9 to about 15 seconds, and from about 0.1 to about 10 percent by weight of a mono(polyisobutenyl)-substituted succinimide of tetraethylenepentamine wherein the polyisobutenyl substituent has a molecular weight of from about 750 to about 5,000.

3,925,114

PROCESS FOR PREPARATION OF MAGNETIC ALLOY POWDER

Noboru Takahashi; Mutsuaki Nakamura; Sadao Ozaki; Hiromasa Isono, and Iwao Fukushima, all of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Japan

Filed Apr. 29, 1974, Ser. No. 465,300
Int. Cl.² C22C *1/04*
U.S. Cl. 148—105 **10 Claims**

1. A process for the preparation of an aluminum-containing magnetic alloy powder, comprising iron and at least one of cobalt and nickel, the process comprising the steps of:

preparing an aqueous solution of water-soluble salts of the respective alloy component metals and a water-soluble salt of aluminum, the amount of said salt of aluminum being such that the amount of aluminum ion in said solution is between 1 and 20 mole % of the total metal ions; regulating pH of said solution to about 1.5;

preparing a solution of oxalic acid in a mixture of a major amount of acetone and a minor amount of toluene;

mixing said aqueous solution and said solution of oxalic acid with stirring to precipitate a crystalline powder consisting of the oxalates of said alloy component metals and aluminum; and

heating said crystalline powder in a hydrogen atmosphere at a temperature between 300 and 400°C until said powder is reduced to powdered metal magnetic alloy.

3,925,115

PROCESS EMPLOYING COOLING IN A STATIC ATMOSPHERE FOR HIGH PERMEABILITY SILICON STEEL COMPRISING COPPER

James A. Salsgiver, Sarver, and Frank A. Malagari, Freeport, both of Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed Nov. 18, 1974, Ser. No. 524,831
Int. Cl.[2] H01F 1/04
U.S. Cl. 148—112 15 Claims

1. In a process for producing electromagnetic silicon steel having a cube-on-edge orientation and a permeability of at least 1850 (G/O_e) at 10 oersteds, which process includes the steps of: preparing a melt of silicon steel; casting said steel; hot rolling said steel into a hot rolled band; subjecting said steel to at least one cold rolling; subjecting said steel to a final annealing prior to the final cold rolling; decarburizing said steel; and final texture annealing said steel; the improvement comprising the steps of carrying out said final anneal prior to the final cold rolling at a temperature of from 1400° to 2150°F for a period of from 15 seconds to 2 hours; cooling said steel from a temperature below 1700°F and above 750°F to a temperature at least as low as 500°F with a liquid quenching medium or gaseous stream and from its maximum annealing temperature to said temperature below 1700°F and above 750°F at a rate which is no faster than one wherein the steel is cooled in a static atmosphere or in a continuous processing line where there is some relative motion between the atmosphere and the steel, although the only deliberate motion is that imparted to the steel; and cold rolling the cooled steel at a reduction of at least 80%; said melt consisting essentially of, by weight, up to 0.07% carbon, from 2.60 to 4.0% silicon, from 0.03 to 0.24% manganese, at least 0.01% selenium, from 0.01 to 0.09% of material from the group consisting of sulfur and selenium, from 0.015 to 0.04% aluminum, up to 0.02% nitrogen, from 0.1 to 0.5% copper, balance iron.

3,925,116

SUPERHARD MARTENSITE AND METHOD OF MAKING THE SAME

Niels N. Engel, 720 Gonzales Road, Santa Fe, N. Mex. 87501

Continuation-in-part of Ser. No. 279,244, Aug. 9, 1972. This application Dec. 14, 1973, Ser. No. 424,672
Int. Cl.[2] C21D 1/00; C23C 15/00
U.S. Cl. 148—143 14 Claims

1. Process of producing a fine grain iron substrate comprising the steps of:

a. subjecting steel having interstitial alloy atoms ranging from about 0.3 to about 1.8% by weight selected from the group consisting of beryllium, boron, carbon and nitrogen to an ion bombardment by an insoluble element selected from the group consisting of helium, neon, argon, krypton, xenon, radon, lithium, sodium. potassium, rubidium, cesium, francium, calcium, strontium, barium, radium, silver, cadmium, mercury, thallium, lead, beryllium, magnesium, yttrium, lanthanum, zirconium, hafnium, thorium, tantalum, copper, indium, selenium, tellurium and polonium sufficient to implant ions of the element into the surface of said substrate in sufficient quantity to retard the growth of crystals during the subsequent heat treatment of the substrate;

b. heating the substrate containing the implanted element to an austenite temperature range; and

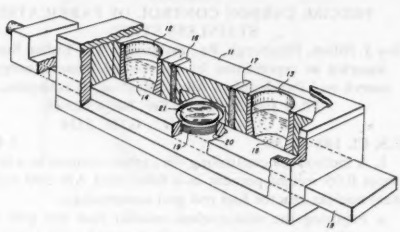
c. quenching the heated substrate at a sufficient rate to produce crystals along the surface of said substrate which are substantially smaller than crystals which normally would have been formed on the surface of the substrate had the ions of the element not been implanted into the surface of the substrate.

3,925,117

METHOD FOR THE TWO-STAGE EPITAXIAL GROWTH OF III–V SEMICONDUCTOR COMPOUNDS

Louis Earl Stone, Richardson, Tex., and Roberto Romano, Mexico City, Mexico, assignors to Texas Instruments, Incorporated, Dallas, Tex.

Division of Ser. No. 147,998, May 28, 1971, Pat. No. 3,747,562. This application July 24, 1973, Ser. No. 382,254
Int. Cl.[2] H01L 7/38
U.S. Cl. 148—171 5 Claims



1. A method for the growth of first and second epitaxial layers of crystalline material on a suitable substrate comprising the steps of:

a. placing said substrate in contact with a first growth solution at suitable growth conditions for a time sufficient to deposit a first epitaxial layer;

b. then transferring the substrate from contact with said first growth solution, into contact with a second solution for a time sufficient to deposit a second epitaxial layer; and

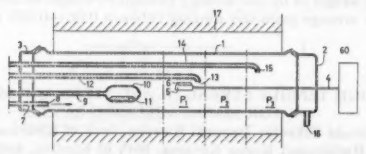
c. concurrently removing substantially all said first solution from the surface of said first epitaxial layer prior to contact with the second solution.

3,925,118

METHOD OF DEPOSITING LAYERS WHICH MUTUALLY DIFFER IN COMPOSITION ONTO A SUBSTRATE

Laszlo Hollan, Sevres, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 13, 1972, Ser. No. 243,592
Claims priority, application France, Apr. 15, 1971, 71.13279
Int. Cl. H01l 7/36; C23c 11/00
U.S. Cl. 148—175 6 Claims



1. A method of providing on a substrate successive layers mutually differing in composition, comprising the steps of:

a. providing an elongated reaction vessel containing said substrate and comprising vapor introduction locations disposed in sequence along the longitudinal axis of said vessel;

b. introducing vapors into said vessel at different said vapor introduction locations, said vapors flowing generally in the longitudinal direction of said vessel and comprising the constituents for said layer materials and being conveyed in said vessel to said substrate, during at least said layer material deposition said vapor introduced at one of said introduction locations differing from vapors introduced at others of said introduction locations with re-

spect to at least one of composition and constituent concentrations; and

c. moving said substrate only along said axis so as to successively maintain said substrate at different positions in said vessel relative to said vapor introduction locations, said layer materials being deposited on said substrate while said substrate is disposed at various ones of said different positions.

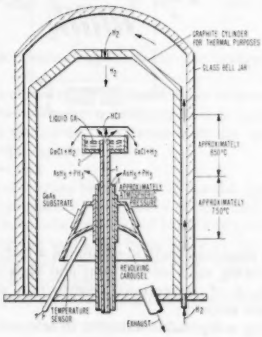
3,925,119
METHOD FOR VAPOR DEPOSITION OF GALLIUM ARSENIDE PHOSPHIDE UPON GALLIUM ARSENIDE SUBSTRATES

John W. Philbrick, Poughkeepsie, and William C. Wuestenhoefer, Mahopac, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 358,241, May 7, 1973, abandoned. This application July 15, 1974, Ser. No. 488,639

Int. Cl.² H01L *21/205, 33/00*

U.S. Cl. 148—175 **10 Claims**



1. A method for producing an epitaxial film of gallium arsenide phosphide on a gallium arsenide substrate where the electroluminescent efficiency of said film of gallium arsenide phosphide is enhanced,

said method comprising reacting in the vapor state and depositing therefrom in the presence of hydrogen the reaction product of gallium and a hydrogen halide combined with arsenic and phosphorous hydride at a partial pressure between 7×10^{-3} and 35×10^{-3} atmospheres at a temperature between 740°C and 800°C, while a substantially constant ratio between the Group III and Group V vapor pressure in a range of 0.5 to 1.0 is maintained and a total pressure of essentially atmospheric pressure.

3,925,120
METHOD FOR MANUFACTURING A SEMICONDUCTOR DEVICE HAVING A BURIED EPITAXIAL LAYER

Hiroji Saida, Hachioji; Yuichi Ono; Masayoshi Nomura, both of Kokubunji; Masao Tamura, Hachioji, and Hirotsugu Kozuka, Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

Division of Ser. No. 295,873, Oct. 10, 1972, abandoned, which is a continuation of Ser. No. 83,526, Oct. 23, 1970, abandoned. This application July 11, 1974, Ser. No. 487,659

Claims priority, application Japan, Oct. 27, 1969, 44-85231; Mar. 13, 1970, 45-20884

Int. Cl.² H01L *29/34, 21/74, 29/06*

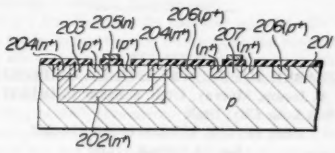
U.S. Cl. 148—175 **12 Claims**

1. A method of manufacturing a semiconductor device comprising the steps of:

a. preparing a semiconductor substrate;

b. providing a recess in the surface of said semiconductor substrate;

c. epitaxially growing a layer in said recess to form an epitaxial layer embedded in and coplanar with said semiconductor substrate and having a conductivity type opposite to that of said semiconductor substrate; and



d. diffusing an impurity into a closed loop region which extends over the edge of the junction layer between said semiconductor substrate and said embedded epitaxial layer and which extends beyond the junction layer to the surface of the semiconductor substrate and to the surface of said embedded epitaxial layer.

3,925,121
PRODUCTION OF SEMICONDUCTIVE MONOCRYSTALS OF GROUP III-V SEMICONDUCTOR COMPOUNDS

Wolfgang Touchy, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 8, 1973, Ser. No. 339,218

Claims priority, application Germany, Mar. 23, 1972, 2214224

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² H01L *7/44*

U.S. Cl. 148—189 **8 Claims**

1. A method of producing a semiconductor monocrystal composed of Group III-V compounds and having a p-conductive layer therein, comprising the steps of;

covering the surface of a monocrystal composed of a Group III-V compound with a protective layer composed of a material that allows Group III elements to diffuse therethrough and selected from the group consisting of silicon dioxide, aluminum oxide and mixtures thereof;

sealing the coated semiconductor monocrystal in an ampule containing a Group II element diffusion source and a gaseous atmosphere composed of about 80% by volume of hydrogen and about 20% by volume nitrogen; and

subjecting the coated semiconductor monocrystal to time-temperature conditions comprising heating the coated monocrystal at a temperature in the range of about 500° to 1,000° C. for a period of time ranging from about 1 to 5 hours whereby the Group III element of the Group III-V compound diffuses out of the monocrystal through the protective layer and the Group II element diffuses into the monocrystal through the protective layer.

3,925,122
MOLDED EXPLOSIVE BODIES HAVING VARIABLE DETONATION SPEEDS

Adolf Berthmann, Leverkusen; Gerhard Martin, Troisdorf, and Maximilian Klünsch, Opladen, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Division of Ser. No. 759,501, Sept. 12, 1968, Pat. No. 3,619,306. This application Feb. 12, 1970, Ser. No. 14,876

Claims priority, application Germany, Sept. 13, 1967, 54099

Int. Cl.² F42B *1/00*

U.S. Cl. 149—2 **3 Claims**

1. A homogeneous high strength molded explosive body comprising a solidified mixture of solid pentaerythrite-tetrani-

trate explosive, hollow spheres of phenolic resin density reducing material and diethyldiphenyl urea binding agent, said molded explosive body having a detonation velocity within a defined range, said detonation velocity being less than the detonation velocity of the explosive itself, said pentaerythritetetranitrate uniformly mixed with said hollow spheres and said binding agent.

3,925,123

POURABLE AQUEOUS BLASTING COMPOSITION

Harvey A. Jessop, Murray, Utah, assignor to IRECO Chemicals, Salt Lake City, Utah

Filed Oct. 11, 1974, Ser. No. 514,205
Int. Cl.² C06B *31/30*
U.S. Cl. 149—60 **4 Claims**

1. In a water resistant explosive composition which contains an aqueous inorganic oxidizer salt solution forming a continuous fluid phase throughout the composition and having a fudge point below intended temperatures of use of the composition; the improvement comprising a thickening system consisting essentially of a combination of non-cross-linked guar gum and starch and a small amount of a self-complexing thickening agent, which thickening system simultaneously provides water resistance, stability at temperatures as high as 60° C and pourability into receptacles as small as 3 inches in diameter or less at temperatures as low as 5° C

3,925,124

HETEROGENEOUS MONOPROPELLANT COMPOSITIONS

Stanley Tannenbaum, Morristown, N.J., assignor to Thiokol Corporation, Bristol, Pa.

Filed Apr. 22, 1964, Ser. No. 363,333
Int. Cl.² C06D *5/10*
U.S. Cl. 149—74 **6 Claims**

1. Novel thixotropic, monopropellant compositions comprising a mixture of a solid fuel selected from the group consisting of inorganic silicides, silicon carbide and mixtures thereof, a strong liquid oxidizer and a thixotroping agent selected from the group consisting of particulated carbon and silica.

3,925,125

MOISTURE REPLACEMENT IN PELLETIZED NITROCELLULOSE

Charles D. Cox, Paw Paw, W. Va.; Craig E. Johnson, Indian Head, and Larry D. Henderson, Bryans Road, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 6, 1973, Ser. No. 422,243
Int. Cl.² C06B *45/00, 25/18, 25/34;* **C08B** *5/04*
U.S. Cl. 149—96 **12 Claims**

1. A process for removing water from water-wet nitrocellulose comprising:

a. treating the nitrocellulose with a first liquid which is a non-solvent for the nitrocellulose and which is miscible with water to form a slurry;

b. adding to the slurry a second liquid which is a non-solvent for the nitrocellulose and which forms an azeotrope with water and the first liquid and is miscible with the first liquid;

c. removing the first liquid and the second liquid from the slurry and an amount of water from the nitrocellulose;

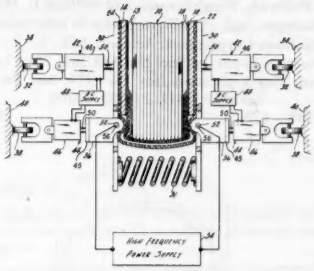
d. recovering nitrocellulose containing up to 0.5% of water by weight.

3,925,126

VIBRATORY BOOK BINDING METHOD

Alfred F. Leatherman, Columbus, Ohio, and Leonard Shatzkin, Croton-on-Hudson, N.Y., assignors to William C. Heller, Jr., Milwaukee, Wis.

Filed July 5, 1973, Ser. No. 376,327
Int. Cl.² B32B *31/18*
U.S. Cl. 156—73.6 **21 Claims**



1. An improved method of joining a body of leaves within an embracing case having front and back covers to form a bound book of conventional construction, said method comprising the steps of:

applying a liquifiable adhesive to selected areas of at least one of the body or case;

placing the body in the case with the covers on either side of the body;

compressing the assembled body and case to bring the adhesive areas of one book element into contact with the other book element;

causing the adhesive to assume a liquid state;

applying vibratory compressive blows to the compressed assembled body, case the liquid adhesive at less than ultrasonic frequencies and at a magnitude sufficient to mechanically enhance the adhesive action in the joinder area; and

terminating the compression of the body and case and the application of the vibratory blows.

3,925,127

BULKY PAPER AND METHOD OF MAKING SAME

Yoshihide Yoshioka, Kawanoe, Ehime-ken, Japan, assignor to Gomei Kaisha Touyo Shoji, Japan

Filed June 26, 1974, Ser. No. 483,295
Claims priority, application Japan, July 9, 1973, 48-77210
Int. Cl.² B32B *3/10, 7/10, 31/08, 31/26*
U.S. Cl. 156—85 **6 Claims**

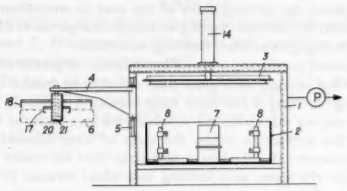
1. A method for producing a bulky paper comprising the steps of inserting a plastic film between a pair of crepe papers, passing the assembly through the nip of a pair of heated embossing rolls to cause a partial adhesion of the plastic film with the crepe papers, subsequently moistening the crepe papers to extend the crepe, and then subjecting the assembly to a thermal treatment to cause a shrinkage or melting of the plastic film and the formation of a network configuration therein.

6. The bulky paper obtained by the process of claim 1.

3,925,128
PROCESS FOR RETREADING A VEHICLE TYRE

Bruno Edler, Roseggerstrasse 25, A-8600 Bruck a.d. Mur, Austria

Division of Ser. No. 52,861, July 7, 1970, Pat. No. 3,738,893. This application Feb. 5, 1973, Ser. No. 329,612
Claims priority, application Austria, July 17, 1969, 6875/69
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² B29H *5/04, 5/16, 17/36*
U.S. Cl. 156—96 **14 Claims**

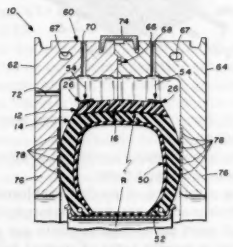


1. A process for retreading a vehicle tyre comprising the steps of:
   a. positioning a closed tread band and a tyre to be retreaded within a vessel with the tread band loosely surrounding the tyre and spaced out of contact with the tyre by an intervening open space;
   b. sealing the vessel;
   c. maintaining said tread band and tyre spaced apart while reducing the pressure in the interior of the vessel, including said space between said tread band and tyre;
   d. thereafter moving said tread band and tyre into contact and eliminating said space therebetween while maintaining said reduced pressure; and
   e. affixing together the contacting tread band and tyre.

3,925,129
TIRE RETREADING SYSTEM

James O. Blankenship, Garland, Tex., assignor to Long Mile Rubber Company, Dallas, Tex.

Filed Apr. 19, 1974, Ser. No. 462,520
Int. Cl.² B29H *5/04, 5/16*
U.S. Cl. 156—96 **27 Claims**



1. A process for retreading a tire with a premolded, precured tread strip including the steps of:
   establishing a thermally responsive adhesive layer around the circumference of a tire body;
   wrapping a premolded, precured tread strip around the circumference of the tire body over the adhesive layer thereon;
   removing air trapped between the tread strip and adhesive layer and the tire body and adhesive layer;
   applying an inwardly directed force along each outer edge of the mounted tread strip around the entire periphery thereof to generate a larger sealing force along each outer edge of the mounted tread strip around the entire periphery thereof than intermediate of the outer edges of the tread strip for forming a sealed zone between the tread strip and the tire body having the thermally responsive layer contained therein;
   positioning the tire body - adhesive layer - tread strip assembly in a chamber having a generally annular shape and a generally U-shaped cross-section;
   forming a seal between the chamber and the side walls of the tire body and thereby forming a sealed zone surrounding the entire circumference of the tire body, the entire premolded, precured tread strip and the adhesive layer therebetween;
   admitting heated, pressurized fluid to the sealed zone and thereby actuating the adhesive layer to form a bond between the tire body and the premolded, precured tread strip;
   said inwardly directed forces preventing the heated and pressurized fluid from entering the zone between the tire body and the tread strip and thereby assuring a uniform bond therebetween.

3,925,130
PRODUCTION OF BONDED FIBROUS PRODUCTS

Robert Brown, Kirkcaldy, Scotland, assignor to Nairn Floors Limited, Lune Mills, England

Filed May 18, 1973, Ser. No. 361,702
Claims priority, application United Kingdom, May 31, 1972, 25541/72; Jan. 29, 1973, 4483/73
Int. Cl.² B32B *5/02*
U.S. Cl. 156—148 **11 Claims**

1. A process of making a needled non-woven carpet having a pile surface comprising the steps of (1) needling a web containing at least 250 g/m² fibres of which at least 50% are tackifiable fibres having a melting point above 160°C. and forming on a surface of the web by the needling a pile which contains at least 10% by weight of the fibres in the web and which is at least 20% of the total thickness of the web to form a pile surface, (2) impregnating at least the entire pile of the needled web by applying direct onto the pile from 100 to 300% by weight of fibres in the web of an aqueous solution containing 3 to 30% by weight of a tackifying agent that has substantially no tackifying effect on the tackifiable fibres below said melting point at its concentration in the solution but which does have a tackifying effect at a temperature below 120°C. when present in a solution of higher concentration, (3) heating the web while uncompressed to a temperature of 100° to 200°C. for half a minute to half an hour to evaporate water and thereby to accumulate solution at fibres intersections and to concentrate the solution sufficiently to tackify the tackifiable fibres of the intersections throughout the pile and subsequently to solidify the fibres, and (4) washing the web to remove tackifying agent.

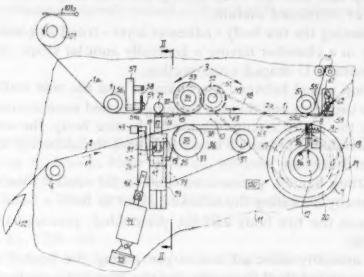
3,925,131
METHOD OF UNITING WEBS OF CIGARETTE PAPER OR THE LIKE

Lothar Krause, Hamburg, Germany, assignor to Hauni-Werke Korber & Co., KG, Hamburg, Germany

Division of Ser. No. 143,700, May 14, 1971, Pat. No. 3,749,634. This application May 22, 1973, Ser. No. 362,755
Int. Cl.² B31F *5/06*
U.S. Cl. 156—159 **10 Claims**

1. A method of making a splice between an expiring web and a fresh web, particularly in a machine for the production or processing of smokers' products, comprising the steps of advancing the expiring web longitudinally; advancing the fresh web longitudinally in the general direction of movement of the expiring web and maintaining the fresh web in spaced-apart position with respect to the expiring web; placing between said webs a uniting band which is adhesive at both sides thereof and spaced from both said webs; moving at least one of the

advancing webs transversely of said direction toward the other web to thus place the advancing webs into contact with the respective sides of the uniting band whereby the band connects the advancing webs to each other and the trailing and



leading portions of the advancing expiring and fresh webs respectively extend rearwardly and forwardly from the uniting band; and severing said trailing and leading portions from the respective webs.

3,925,132

METHOD OF FORMING CIRCUMFERENTIALLY EXTENDING RIBS ON A ROTATING SHELL

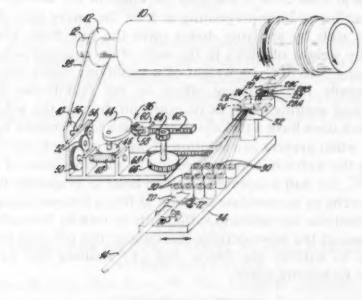
David H. Bartlow, Huntingdon, Pa.; Bernard Howard Jones, Pendleton, S.C., and Lee E. Pearson, Granville, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Sept. 13, 1972, Ser. No. 288,638

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] B32B *17/04*

U.S. Cl. 156—161 **8 Claims**



1. A method of installing glass fiber mat over the sloping surface of an envelope which extends around an axis of revolution, said sloping surface sloping inwardly obliquely toward said axis of revolution, said method comprising: causing said envelope to revolve about said axis of revolution, feeding a mat strip over said sloping surface of said envelope, feeding individual strands to said revolving sloping surface to become wound thereon, said strands being fed generally tangentially under tension over the external surface of said mat in a plane generally normal to said axis of revolution, and causing the tensioned strands to pull said mat down onto said sloping surface of said envelope and then slide obliquely sideways and inwardly toward said axis of revolution over said mat to automatically smooth said mat onto said obliquely sloping surface before said strands assume their final positions on said form.

7. A method of producing a glass fiber reinforced plastic shell having an external stiffening rib thereon, comprising: rotating a generally horizontal cylindrical mandrel about its longitudinal axis, applying a coating of resin and glass fiber shell forming materials onto the surface of the mandrel, feeding a band of strands generally tangentially to the bottom of the cylindrical mandrel over the shell forming materials and causing the strands to be pulled thereon by the mandrel, feeding a mat of glass fibers to the mandrel on top of the strands, wetting the mat and strands with resin, feeding a form having a cross section that is an isosceles trapezoid having its short parallel side resting on the mat, said band of strands having portions directly beneath the sloping sides of the form, and tensioning the strands to cause strands on opposite sides of the top to bring the mat against the sloping sides of the form and thereafter slide down the sloping sides of the mat to smoothen the mat and with the strands coming to rest on the portions of the mat which engage the shell forming materials.

8. A method producing a glass fiber reinforced plastic rib on the revolving surface of a glass fiber reinforced plastic shell comprising: feeding a rib form strip having a generally flat base and sloping sides onto the revolving surface with the base adjacent the surface to cause the strip to wrap around the surface, concurrently feeding a mat strip over the outer surface of the rib form, and feeding individual strands to the revolving surface to become wound thereon, wetting the mat and strands with resin, said strands being fed generally tangentially under tension to the revolving surface at locations outwardly of the mat and sloping sides of the rib form, and causing the tensioned strands to pull the mat down onto the sloping sides of the rib form and then slide over the mat to come to rest on the revolving surface at the foot of the rib form, and whereby the mat is automatically smoothed onto the rib form.

3,925,133

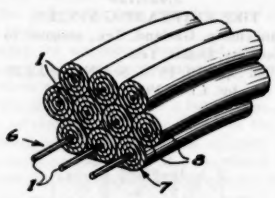
METHOD FOR MAKING REINFORCED PYROLYTIC GRAPHITE-SILICON CARBIDE MICROCOMPOSITES

Eugene L. Olcott, Falls Church, Va., assignor to Atlantic Research Corporation, Alexandria, Va.

Division of Ser. No. 65,899, Aug. 21, 1970, Pat. No. 3,738,906. This application Nov. 27, 1972, Ser. No. 309,639

Int. Cl. C01B *31/07*

U.S. Cl. 156—175 **5 Claims**



1. A method for making a reinforced pyrolytic graphite article comprising:

1. progressively positioning continuous refractory filaments or strands on a shaped form;
2. pyrolyzing a mixture of methyl trichlorosilane, an inert gas, and hydrocarbon gas, said mixture having a volumetric ratio of inert gas to hydrocarbon gas of at least 86.7 to 13.3 and a weight ratio of methyl trichlorosilane to hydrocarbon gas of between about 5 to 95 and 75 to 25, onto said filament or strand at a temperature of about 2800°F. — 3800°F. at about the point of positioning contact as said filament or strand is positioned and thereby nucleating a microcomposite of pyrolytic graphite and silicon carbide from said filament or strand;
3. progressively positioning additional refractory continuous filament or strand laterally spaced from and superimposed on previously positioned filament or strand; and
4. as said additional filament or strand is positioned, simultaneously pyrolyzing said mixture of methyl trichlorosilane, an inert gas, and hydrocarbon gas on said additional

filament or strand at about the point of positioning contact and on the microcomposite of pyrolytic graphite and silicon carbide nucleated from previously positioned filament or strand to form a microcomposite matrix interconnecting laterally spaced filaments or strands, said matrix comprising crystallite layers of pyrolytic graphite containing embedded SiC aciculae in which the longitudinal axes of said aciculae are aligned substantially in the *c*-direction relative to the *a-b* plane of the associated pyrolytic graphite crystallite.

3,925,134

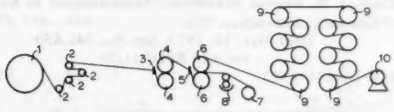
PROCESS FOR PREPARING SUPPORTED RIBBONS

Robert T. Montgomery, Matthews, N.C., assignor to Celanese Corporation, Charlotte, N.C.

Division of Ser. No. 185,015, Sept. 30, 1971, Pat. No. 3,776,808. This application July 5, 1973, Ser. No. 376,753

Int. Cl.² B32B *5/08, 7/04*

U.S. Cl. 156—178 **3 Claims**



1. A process for the preparation of supported ribbon having improved bulk and cover, said process comprising (a) applying adhesive to a support and (b) bonding only peripheral filaments of substantially parallel, substantially zero twist compacted continuous filament yarns to said adhesive coated support whereby a continuous filament ribbon having a bulked three dimensional effect is produced.

3,925,135

METHOD OF MAKING LAMINATES OF SUPPORT MATERIAL AND FLUORINATED POLYMER CONTAINING PENDANT SIDE CHAINS CONTAINING SULFONYL GROUPS

Walther Gustav Grot, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 196,772, Nov. 8, 1971, Pat. No. 3,770,567. This application Aug. 1, 1973, Ser. No. 384,499

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² B32B *7/04, 17/04, 27/06*

U.S. Cl. 156—213 **4 Claims**

1. A process for preparing a laminate of a first layer of fluorinated polymer containing pendant side chains containing sulfonyl groups wherein the sulfonyl groups are in the $-(SO_3)_nMe$ form wherein Me is a metallic cation or NH_4 and n is the valence of Me and a second layer of fluorinated polymer containing pendant side chains containing sulfonyl groups wherein the sulfonyl groups are in the $-SO_2M$ form wherein M is a halogen atom, said second layer being integral with said first layer and containing support material completely encapsulated therein which comprises

1. contacting the $-SO_2M$ surface of a film of a fluorinated polymer containing pendant side chains containing sulfonyl groups wherein the sulfonyl groups of one surface of said film are in the $-SO_2M$ form wherein M is a halogen atom and the sulfonyl groups of the other surface of the film are in the $-(SO_3)_nMe$ form wherein Me is a metallic cation or NH_4 and n is the valence of Me with a support material, and
2. applying a differential pressure to the contacted support material and film, the pressure on the opposite surface of the support material from that which is contacting said fluorinated polymer film being at least 5 inches of mercury less than the pressure on the surface of the fluorinated polymer film opposite to that contacting the support material, for a sufficient period of time to cause the support material which is in contact with said film to become completely encapsulated within the film of fluorinated polymer while heating the film and support material at from 240°–320°C.

3,925,136

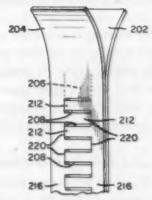
METHOD OF MAKING PLIABLE TAPE STRUCTURES

Alfred W. Wakeman, Madison Road, Durham, Conn. 06422

Division of Ser. No. 379,265, July 16, 1973, Pat. No. 3,851,353, which is a division of Ser. No. 159,796, July 6, 1971, Pat. No. 3,751,760, which is a continuation-in-part of Ser. No. 859,619, Sept. 23, 1969, abandoned. This application Nov. 21, 1974, Ser. No. 525,743

Int. Cl.² B32B *31/00*

U.S. Cl. 156—252 **1 Claim**



1. A method of producing a tape with bridging tabs of square wave form which comprises bonding confronting strips of sheet material together along their central portions to provide freely separable marginal portions, slotting the bonded strips in their intermediate portion transversely of the tape axis at spaced intervals therealong to form said bridging tabs, and slitting each of said strips longitudinally of the tape axis to sever said bridging tabs from alternately opposite marginal portions of said strips, said slitting being arranged in alternation on opposite faces of the confronting strips so that both strips are not slit through at the same location.

3,925,137

METHOD FOR PRODUCING FLAME-RETARDANT FIREPROOF CLEAR COAT

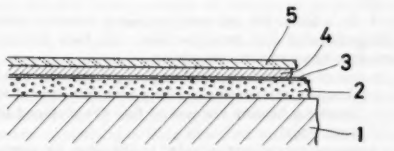
Masutada Kamei, Tokyo, Japan, assignor to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Mar. 12, 1974, Ser. No. 450,325

Claims priority, application Japan, Mar. 13, 1973, 48-29777

Int. Cl.² B32B *33/00;* **C09D** *5/18;* **C09K** *3/28*

U.S. Cl. 156—278 **5 Claims**



1. A method for forming a flame-retardant fireproof and decorative coat, characterized by applying to the surface of a substrate a flame-retardant foaming paint composed of 30 – 40 parts by weight of ammonium phosphate monobasic, 20 parts by weight of pentaerythritol, 20 parts by weight of dicyandiamide and 40 – 60 parts by weight of a vehicle using polyvinyl acetate as a main ingredient and having an involatile matter content of 60% and diluted with water, subsequently attaching thereto a decorative material, and further applying thereto a flame-retardant clear paint composed of 100 parts

by weight of a polyurethane resin of the type used in paints having a viscosity of 10 – 13 sec. (FC No. 4 at 20°C), 7 – 10 parts by weight of tris(2-chloroethyl)-phosphate and 1 – 3 parts by weight of tris(2-bromoethyl)-phosphite and finally drying the applied films.

3,925,138

PROCESS FOR PREPARING AN INSULATING SUBSTRATE FOR USE IN PRINTED CIRCUITS

Anthony James Shaul, Wokingham, and Edward Russell Wood, Twyford, both of England, assignors to Formica International Ltd., London, England

Filed Nov. 27, 1973, Ser. No. 419,475

Int. Cl.² C09J *7/00*

U.S. Cl. 156—313 **7 Claims**

1. A process for preparing an insulating substrate suitable for use in the production of printed circuits by electroless deposition techniques, the process consisting essentially of the steps:

1. substantially fully curing a mixture consisting essentially of (a) an etchable synthetic rubber polymer which, in the substantially fully cured state, is attackable by a chemical etchant solution and (b) a first thermosettable resin, to give a selectively etchable and substantially non-adhesive layer consisting essentially of said rubber and the thermoset resin,
2. superimposing said layer on a fibrous substrate which consists essentially of at least one sheet or web, said sheet or web being impregnated with a second thermosettable resin, and
3. consolidating the assembly so produced and curing said second thermosettable resin by heating under pressure.

3,925,139

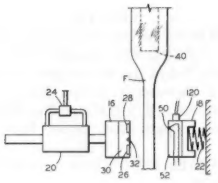
SEAL MONITORING APPARATUS

Charles J. Simmons, East Longmeadow, Mass., assignor to Package Machinery Company, East Longmeadow, Mass.

Filed Jan. 10, 1974, Ser. No. 432,321

Int. Cl.² G05G *15/00*

U.S. Cl. 156—358 **15 Claims**



1. In a form, fill and seal packaging machine which discharges sealed film pouches filled with bulk material, seal monitoring apparatus comprising:

a pair of reciprocating sealing jaws periodically moved into clamping relationship on the pouch film, one of the jaws bearing a heating element to fuse the clamped film and form a seal;

a temperature sensor mounted on the other jaw opposite the heating element and at a station on the jaw contacted by the clamped film to detect the film temperature on the side of the clamped film opposite the heating element;

a memory for storing a preselected seal temperature limit; and

a comparator connected to the temperature sensor and the memory for comparing the sensed temperature and the preselected temperature limit and producing a signal when the limit is exceeded.

4. In a packaging machine which forms a heat seal in multiple piles of a fusible material by means of a pair of heat-sealing members which close in mating relationship on the material, the first of the sealing members having a heating element positioned to heat the material at one side of the plies and the second of the sealing members having a clamping surface disposed during a sealing operation at the other side of the plies directly opposite the heating element of the first sealing member, the seal monitoring apparatus comprising:

sensing means connected with and cooperative with the sealing members to generate a signal representative of the temperature of the fusible material during operation of the sealing members in the packaging machine, the sensing means including a temperature sensor mounted on the second sealing member opposite the heating element of said first sealing member and at a station on said second sealing member which is contacted by said fusible material whereby the sensor detects the temperature to which the fusible material is elevated on said other side of clamped plies.

3,925,140

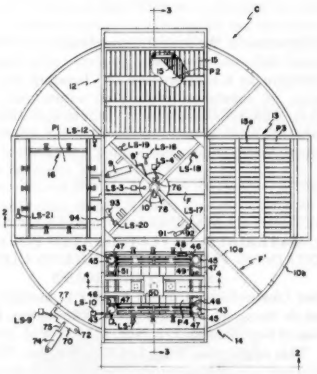
FABRICATING APPARATUS FOR TWIN-SHEETS

Gaylord W. Brown, Beaverton, Mich., assignor to Koehring Company, Milwaukee, Wis.

Filed Mar. 16, 1973, Ser. No. 341,850

Int. Cl.² B32B *31/26*

U.S. Cl. 156—382 **3 Claims**



1. Apparatus for forming hollow objects from first and second thermoplastic sheets wherein the amount of heat required to bring a first sheet to its forming temperature differs substatially from the amount of heat required to bring a second sheet to its forming temperature, said apparatus comprising heating means, diferential pressure, mold forming means located at a forming station adjacent said heating means, carrier means for advancing first and second sheets in uniformly spaced alternate succession in intermittent step-by-step movement along a fixed path with each first sheet being located one step in advance of a second sheet, said carrier means carrying said sheets in succession into operative relationship with said heating means and subsequently advancing said sheets in succession into operative relationship with said forming means at said forming station while pausing for a predetermined time interval between successive steps of movement to accommodate heating and forming of said sheets while said sheets are at said heating means and forming station, means at said forming station operable on alternate steps of movement of said carrier means to transfer a first sheet from said carrier means to said forming means within said predetermined time interval between a first step of movement of said carrier means and its next step of movement and operable after said next step of movement of said carrier means advances a second sheet into operative relationship with said forming means to actuate said forming means to form said

object within the predetermined time interval between said next step of movement and the next subsequent step of movement, and first heater control means responsive to the arrival of a first sheet at said heating means for operating said heating means to supply a first amount of heat to said first sheet within said predetermined time interval and responsive to the arrival of a second sheet at said heating means for operating said heating means to supply a second amount of heat, differing from said first amount of heat, to said second sheet within said predetermined time interval.

3,925,141

MACHINE FOR MANUFACTURING PNEUMATIC TIRES, IN PARTICULAR RADIAL TIRES

Renato Caretta, Varese, Italy, assignor to Industrial Pirelli S.p.A., Milan, Italy

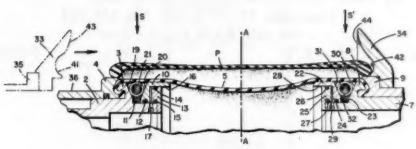
Filed Sept. 8, 1972, Ser. No. 287,275

Claims priority, application Italy, Sept. 14, 1971, 28578/71

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] B29H *17/16*

U.S. Cl. 156—416 **1 Claim**



1. An expansible type drum machine for building pneumatic tires comprising

two shoulders to support the carcass zones concerned with the bead cores, said shoulders being movable relative to each other in an axial direction;

means for admitting a fluid under pressure inside the drum during the shaping of the carcass;

a helical spring, for each drum shoulder, closed as a ring and mounted under tension, each of said drum shoulders defining a groove of conical surfaces, facing each other, and being formed of two elements forming a part of the corresponding drum shoulder, said elements slidable axially relatively to each other so as to vary the width of said groove and cause the expansion and the contraction of the helical spring, and

two bells, facing each other and having an inner profile axially narrower than that of the freely shaped carcass, said bells extending radially for a portion of the height of the section of the completely shaped carcass, and abutting the carcass sides on the inner profiles thereof during the shaping of the carcass.

3,925,142

METHOD OF AND APPARATUS FOR BIAS LAYING

Charles A. Lee, and Warren R. Furbeck, both of Knoxville, Tenn., assignors to International Paper Company, New York, N.Y.

Continuation-in-part of Ser. No. 95,756, Dec. 7, 1970, Pat. No. 3,715,255. This application Dec. 1, 1972, Ser. No. 311,313

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

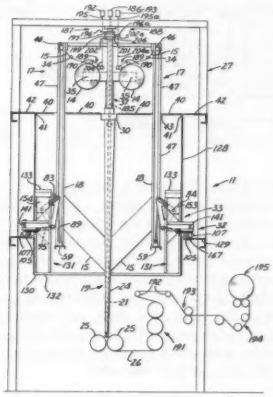
Int. Cl.[2] B65H *81/00*

U.S. Cl. 156—425 **10 Claims**

1. An apparatus for generally helically winding at least one web into a tube and for flattening the tube to form a multi-ply bias-laid ribbon, said apparatus comprising:

a carrier rotatable in a circular path about a vertical axis, means for supporting and carrying at least one parent web roll in a circular path about said axis and in a horizontal plane and from which a web travels forwardly, a vertically extending mandrel centered on said vertical axis and having horizontally spaced areas for contacting and for carrying said web vertically and at a substantially constant speed to discharge continually as a tube, folding bar means on said carrier movable in a circular path and at a fixed radial distance from said axis guiding said web and discharging the web to each of said mandrel areas at a predetermined angle, said folding bar means traveling from positions closely adjacent each of said horizontally spaced mandrel areas outwardly therefrom for a predetermined arcuate extent and then traveling inwardly toward the other of said spaced mandrel areas to positions closely adjacent to said other mandrel areas, means for shifting said folding bar means to ascend and descend relative to said mandrel and to said carrier during said circular path rotation of said carrier and said folding bar means to provide a substantially uniform travel of said web onto said mandrel and vertically along said mandrel and means for removing said tube from said mandrel and for flattening said tube into a multi-ply bias-laid ribbon.

7. An apparatus for generally helically winding at least



one web into a tube and for flattening the tube to form a multi-ply bias-laid ribbon, said apparatus comprising:

a carrier rotatable about a vertical axis and carrying at least one parent web roll from which a web travels forwardly, a vertically extending mandrel having horizontally spaced areas for contacting and for carrying said web vertically and at a substantially constant speed, folding bar means on said carrier for guiding said web and for discharging the web to the mandrel at a predetermined angle, means for shifting said folding bar means vertically relative to said mandrel during rotation of said carrier to provide a substantially more uniform travel of said web onto and vertically along said mandrel, said means for shifting said folding bar means comprising a cam ring disposed in a horizontal plane and a cam follower means for converting horizontal displacements by said cam ring into vertical displacements of said folding bar means, said folding bar means comprising a slide mounted on said carrier for rectilinear vertical movement and a folding bar carried by said slide for movement therewith vertically.

3,925,143

METHOD AND APPARATUS FOR AUTOMATICALLY SPLICING FILM

Bruce D. Aldo, 6 Redwing Road, Enfield, Conn. 06082

Filed June 3, 1974, Ser. No. 475,946

Int. Cl.[2] G03D *15/04*

U.S. Cl. 156—505 **5 Claims**

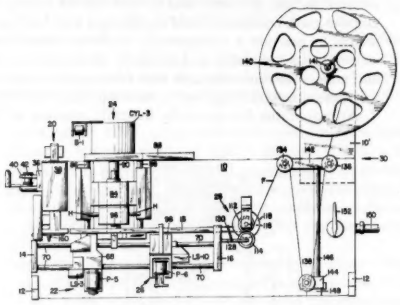
1. Apparatus for splicing the lead end of a second identified exposed film strip to the trailing end of a first or next preced-

ing film strip, each film strip being of the type having image-bearing areas thereon and openings therein adjacent the leading and trailing ends thereof, comprising:

a film track for guiding the film strips,

a lead carriage assembly and a tail carriage assembly for selectively gripping and moving the film strips along the film track,

means for effecting reciprocating movement of the lead carriage and tail carriage assemblies relative to the track, means for photographically exposing the leading end of the second film strip for an impression of identifying coded indicia thereon,



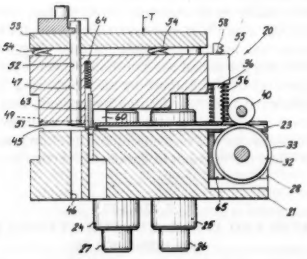
a cutting station for cutting the leading and trailing ends of the second film strip along a predetermined transverse line with reference to the image bearing areas,

a splicing station for splicing together the trailing end of the first or next preceding film strip to the leading end of the second film strip by means of a heat-setting adhesive tape member joined in sealed interlocking position with respect to the respective ends, and means for sensing the openings adjacent the leading and trailing ends of the film strips for selectively actuating the lead carriage assembly and the tail carriage assembly.

3,925,144
APPARATUS FOR APPLYING REINFORCEMENT ZONES TO SHEET MATERIAL

William F. Lowe, Bridgehampton, and Harry L. Bondy, Plainview, both of N.Y., assignors to E-Z Machine Corporation, Plainview, N.Y.

Filed Oct. 18, 1973, Ser. No. 407,623
Int. Cl. B32b *31/00*
U.S. Cl. 156—518 **10 Claims**



1. A device for applying patches of a strip of resilient thermally adhesive material to a substrate, comprising:

a pair of relatively displaceable die members receiving said substrate between them, at least one of said die members being continuously heated;

means for feeding said strip into juxtaposition with a surface of said substrate between said die members;

cutting means on said die members for severing a portion of the strip juxtaposed with said substrate from the remainder of said strip;

means for buckling said strip as it is fed into juxtaposition with said surface of said substrate for preventing adhesion of said remainder of said strip to said cutting means and of said severed portion to said die members during the cutting of said severed portion from said remainder of said strip;

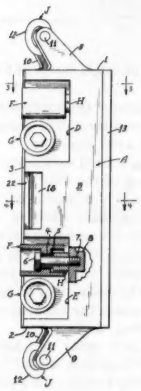
means on said die members for compressing said severed portion against said substrate and thereby bonding said severed portion thereto; and

a holddown element on one of said members effective intermediate the severing of said portion of the bonding thereof to said substrate for yieldably retaining said portion against said substrate.

3,925,145
CORNER ROLLER FOR EMBEDDING TAPE IN MASTIC

Robert G. Ames, Hillsborough, Calif., assignor to Ulysses Stanley Ames, San Carlos, Calif., a part interest

Filed Jan. 31, 1974, Ser. No. 438,182
Int. Cl.² B32B *31/20, 35/00*
U.S. Cl. 156—579 **5 Claims**



1. A corner roller for embedding tape in a room corner where the mastic and tape have already been applied to cover the corner joint and comprising:

a. a tool body having a pair of integral wings whose outer surfaces extend substantially at right angles to each other;

b. said body having a pair of compartments, both being spaced from one another and extending into the areas of both wing outer surfaces and straddling the junction of said outer surfaces;

c. a pair of rollers mounted in each compartment, the axis of one roller in each pair paralleling the outer surface of one wing with the cylindrical peripheries of these rollers projecting a slight distance beyond the plane of said adjacent outer surface and the axis of the other roller in each pair paralleling the outer surface of the other wing with the cylindrical peripheries of these last named rollers projecting a slight distance beyond the plane of the adjacent outer surface of the other wing, the peripheral portions of said rollers that project beyond the outer surfaces of both wings being adapted to contact with the tape for embedding it in the mastic as the tool is moved over the tape; and

d. a double bevelled tape creasing and guiding wheel mounted at each end of said tool body and having its periphery lying substantially tangent to a line that coincides with the juncture line formed by the outer surfaces of the two wings whose outer surfaces extend substantially at right angles to each other.

3,925,146

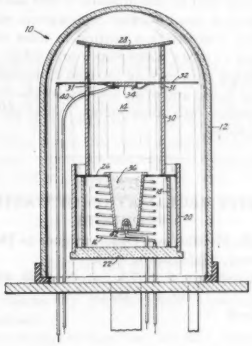
METHOD FOR PRODUCING EPITAXIAL THIN-FILM FABRY-PEROT CAVITY SUITABLE FOR USE AS A LASER CRYSTAL BY VACUUM EVAPORATION AND PRODUCT THEREOF

Keith H. Olsen, and Marvin H. Christmann, both of Bloomington, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 96,390, Dec. 9, 1970, abandoned. This application Dec. 7, 1972, Ser. No. 312,957

Int. Cl. B44d *1/18*; **C23c** *13/02*

U.S. Cl. 156—601 **8 Claims**



1. A vacuum evaporation process for producing an epitaxial thin-film Fabry-Perot cavity suitable for use as a laser crystal, comprising the steps of:

a. positioning within a reaction chamber having restricted openings for controlling the flow of vapors from the reaction chamber to a surrounding enclosure, a container containing as a source material a quantity of a direct band-gap semiconductor material, and further positioning within said reaction chamber a substrate having a test growth surface spaced from said source material;

b. evacuating said surrounding enclosure to a pressure of less than 10^{-5}Torr,

c. heating said source material to sinter and out-gas said material until only an adherent film is observed to form on said test growth surface, and determining the source material and test growth surface temperatures at which said film is formed as an evaporation-reaction temperature and a condensation-reaction temperature, respectively;

d. positioning within said reaction chamber at a region in which the growth conditions are the same as at the test growth surface, a crystalline substrate having a growth surface;

e. preheating said crystalline substrate to a temperature greater than said condensation-reaction temperature;

f. heating said source material to said evaporation-reaction temperature;

g. terminating said step of preheating said substrate after said source material has reached said evaporation-reaction temperature thereby allowing said growth surface to cool to an equilibrium state wherein said growth surface is maintained at said condensation-reaction temperature by heat radiated within said reaction chamber as a result of continuing to heat said source material, thereby causing vapors of said source material to be deposited as a uniform epitaxial film on said substrate growth surface; and

h. terminating said step of heating said source material when said uniform epitaxial film is formed.

3,925,147

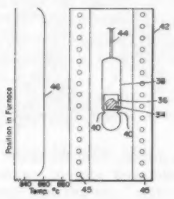
PREPARATION OF MONOCRYSTALLINE LEAD TIN TELLURIDE

Hiroshi Kimura, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 176,157, Aug. 30, 1971, abandoned. This application July 2, 1973, Ser. No. 375,417

Int. Cl.² H01L *7/62*; **B01J** *17/00*

U.S. Cl. 156—603 **5 Claims**



1. A method for synthesizing a single crystal of lead tin telluride composition from a polycrystalline source material thereof comprising the step of heating the source material in an isothermal environment and at a resulting sufficiently high uniform temperature for forming a solid and liquid heterogeneous phase therefrom in which the quantity of the solid phase is large with respect to the quantity of the liquid phase and in which the liquid phase acts as a diffusion medium for enabling mass transfer until the solid phase comes into equilibrium with the liquid phase, thereby for permitting the solid phase to form into the single crystal.

3,925,148

HEAT EXCHANGERS & EVAPORATORS

Ransome W. Erwin, Ogden, Utah, assignor to Austral-Erwin Engineering Co., Houston, Tex.

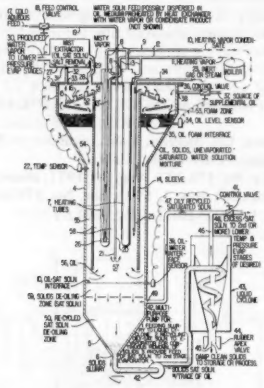
Division of Ser. No. 401,655, Sept. 28, 1973, which is a continuation-in-part of Ser. No. 306,183, Nov. 14, 1972, Pat. No. 3,891,496. This application Dec. 27, 1974, Ser. No. 536,792

Int. Cl.² B01D *1/00*, *1/22*; **B03C** *3/00*

U.S. Cl. 159—23 **20 Claims**

1. An apparatus for evaporating aqueous solutions containing solids and/or mineral salts without adherence of such solids to any surfaces contacted by the aqueous solution, wherein all contacted surfaces are preferentially oil wettable and coated with an oily liquid, and all heated surfaces are also substantially zero water adsorbent, said apparatus comprising an outer container enclosing a confined heating and vaporizing zone, having therein heating means arranged to be externally contacted by fluids within said heating and vaporizing zone and being provided with an exterior contacting surface which is both preferentially oil wettable and substantially zero water adsorbent; a source of cold aqueous feed solution containing solids and/or dissolved mineral salts, a feed line leading from said source of aqueous solution to a portion of said confined heating and vaporizing zone adjacent to but below said heating means, means for passing oil and saturated solution and oil up through said heating and vaporizing zone and ing zone, means for effecting flow of said aqueous feed solution and oil by through said heating and vaporizing zone and into contact with the exterior of said heating means, and other contacted surfaces whereby said heating means and surfaces

are externally coated with oil and said aqueous feed liquid is at least partially vaporized and the vapors separated from the oily liquid and solids, upper outlet means for withdrawing hot vapor, derived from contacting said aqueous feed solution



with said heating means, from the upper portion of said container, lower outlet and recycle means for withdrawing a slurry including solids, salts and oily saturated aqueous solution from the lower portion of said container for further treatment and said recycling.

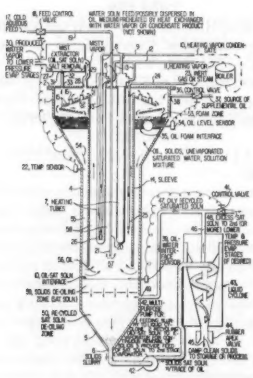
3,925,149
HEAT EXCHANGERS & EVAPORATORS

Ransome W. Erwin, Ogden, Utah, assignor to Austral-Erwin Engineering Co., Houston, Tex.

Continuation-in-part of Ser. No. 306,183, Nov. 14, 1972, Pat. No. 3,891,496. This application Sept. 28, 1973, Ser. No. 401,655

Int. Cl.[2] B01D *1/00*; **F26B** *7/00*; **F28F** *13/18*; **B01D** *3/34*

U.S. Cl. 159—47 **12 Claims**



1. The method of evaporating an aqueous feed solution containing dissolved and/or suspended solids or mineral salts without adherence of the solids or mineral salts to any surfaces contacting the aqueous solution, said surfaces being hereinafter referred to as fluid contacting surfaces, said method being carried out in an apparatus comprising a main vessel having an outer wall and containing a vertical open-ended heating zone spaced from the outer wall, said heating zone having heating means therein and a settling zone below the heating zone, and succeeding separating zones, both inside and outside the main vessel;

said heating zone, heating means, settling zone and separating means having fluid contacting surfaces;

all fluid contacting zones within said apparatus being preferentially oil wettable and all fluid contacting surfaces within the confining heating zone comprising substantially zero water adsorbent fluorocarbon polymers, which method comprises the following steps:

a. supplying the feed solution, prior to entry into the heating zone, into an organic liquid immiscible with the aqueous feed solution, intimately mixing said organic liquid and aqueous solution,

b. feeding the mixture centrally into said main vessel downwardly to a discharge point below the heating zone but above the settling zone, passing the said mixture upwardly through said heating zone and into contact with the heating means therein whereby all fluid contacting surfaces within the confining heating zone are wetted with said organic liquid, supplying sufficient heat to the mixture within said heating zone to effect at least partial evaporation of the aqueous solution, converting a portion at least of the aqueous solution to misty water vapor and solids slurry, and

c. separating the resulting mixture comprising immiscible organic liquid and misty vapors, solids-slurry and aqueous solution into components, in said succeeding separating zones.

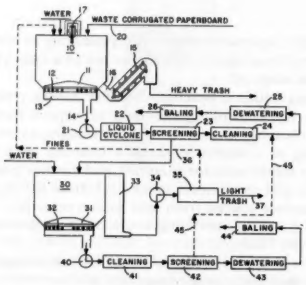
3,925,150
SELECTIVE RECLAMATION OF WASTE PAPER PRODUCTS

Paul G. Marsh, Middletown, Ohio, assignor to The Black Clawson Company, Middletown, Ohio

Filed Apr. 6, 1973, Ser. No. 348,496

Int. Cl.[2] D21C *5/02*

U.S. Cl. 162—4 **5 Claims**



1. The process of selectively recovering two different fibrous constituents of waste paper products which have different properties of defiberability from a mixture of such products, comprising:

a. subjecting said mixed products to a primary pulping action in water suspension,

b. terminating said pulping action on said suspension as a whole as soon as the majority of the more readily defibered of said products is defibered sufficiently for passage through screening openings of a predetermined small size and while the majority of the less readily defibered of said products has not defibered sufficiently for passage through said holes,

c. selectively extracting said defibered product from said suspension by effecting passage thereof through screening holes of said predetermined size, and thereafter

d. subjecting the remaining said suspension to further defibering treatment to defiber the paper products remaining therein.

3,925,151

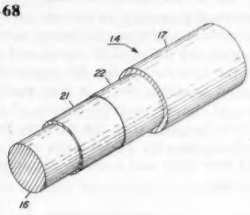
NUCLEAR FUEL ELEMENT

Harold H. Klepfer, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Feb. 11, 1974, Ser. No. 441,133

Int. Cl.² G21C *3/20*

U.S. Cl. 176—68 **32 Claims**



1. A nuclear fuel element which comprises a metallic elongated container in the form of a right circular cylinder, a layer of high lubricity material being disposed in and adjacent to the inside surface of said container, a low neutron capture cross section metal liner being disposed in said container and adjacent to said layer, a body of nuclear fuel material disposed in said container and surrounded by said liner, and end plugs sealing each end of said container.

3,925,152

VIRUS SEPARATION

Jerker Olof Porath, and Jan-Christer Janson, both of Uppsala, Sweden, assignors to Exploaterings Aktiebolaget T.B.F., Uppsala, Sweden

Continuation-in-part of Ser. No. 261,807, June 12, 1972, abandoned. This application Dec. 11, 1973, Ser. No. 423,730

Claims priority, application Sweden, June 18, 1971, 7968/71

Int. Cl.² C12K *7/00*

U.S. Cl. 195—1.5 **1 Claim**

1. Method of separating a mixture of virus variants of substantially the same size by bringing the mixture in aqueous suspension to pass a bed of adsorbent, characterized in that the adsorbent is constituted of an insoluble, organic macroporous polymer selected from the group consisting of agar, agarose, dextran and cellulose, containing amphoteric substituents composed of both basic nitrogen-containing groups and carboxylate or sulphonate groups, where the proportion between the basic and the acid groups is simple and stoichiometric, whereby said viruses adsorb to said adsorbent, eluting said viruses in a plurality of elution steps with solutions of successively different ion strength, to thereby obtain virus variant separation and collecting the eluates in separate fractions.

3,925,153

COMPOSITION FOR CONSERVATION OF BLOOD

Henri Laborit, Paris, France, assignor to Centre d'Etudes Experimentales et Cliniques de Physio Biologie de Pharmacologie et d'Eutonologie, Paris, France

Continuation-in-part of Ser. Nos. 143,568, May 14, 1971, abandoned, and Ser. No. 19,532, March 18, 1970, abandoned, and Ser. No. 670,186, Sept. 25, 1967, abandoned. This application Jan. 8, 1973, Ser. No. 321,642

Int. Cl.² A61K *35/14*

U.S. Cl. 195—1.8 **3 Claims**

1. A composition comprising one part of collected red blood cells stabilized with respect to 2,3-diphosphoglycerate content with 1 to 99 parts of a blood-2,3 diphosphoglycerate stabilizing combination consisting essentially of:

a. An effective amount of dihydroxyacetone sufficient when administered with effective amounts of:
b. sodium citrate dihydrate,
c. citric acid monohydrate and
d. phosphate monosodium monohydrate or mixture thereof to maintain ph and PO_2 values and globular 2,3 D.P.G. (diphoshoglycerate) levels for 9 days in vitro and thereby to conserve glycolysis of said R.B.C. (red blood cells, in vitro) for at least 9 days in vitro as compared with 3 days in vitro stability of 2,3 diphosphoglycerate content when red blood cells are stabilized with (b) (c) (d) and glucose, and
e. an amount of nicotinamide effective to maintain the globular 2,3 diphosphoglycerate content of red blood cells 11 days in vitro.

3,925,154

METHOD OF PRODUCING INOSINE-5′-MONOPHOSPHATE

Hitoshi Enei, Zushi; Hiroshi Matsui, Yokohama, and Yoshio Hirose, Fujisawa, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Oct. 7, 1974, Ser. No. 512,465

Claims priority, application Japan, Oct. 12, 1973, 48-114487

Int. Cl.² C12D *13/06*

U.S. Cl. 195—28 N **4 Claims**

1. A method of producing inosine-5′-monophosphate from a starting material consisting of inosine and hypoxanthine which comprises culturing a strain of Corynebacterium sp. selected from the group consisting of strain FERM-P 2310 and strain FERM-P 2311 in an aqueous culture medium containing assimilable sources of carbon and nitrogen, inorganic ions and minor organic nutrients necessary for the growth of said strain, said starting material, and phosphate ions until said starting material is converted to said inosine-5′-monophosphate, and said inosine-5′-monophosphate accumulates in said medium, and recovering the accumulated inosine-5′-monophosphate from said medium.

3,925,155

PREPARATION OF 6-AMINOPENICILLANIC ACID 1-OXIDE

Eiji Kondo, Ikeda; Takashi Mitsugi, Takaishi, and Ryonosuke Muneyuki, Takatsuki, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Sept. 11, 1974, Ser. No. 505,086

Claims priority, application Japan, Sept. 21, 1973, 48-107299

Int. Cl.² C12D *9/14*

U.S. Cl. 195—36 P **9 Claims**

1. A process for preparing 6-aminopenicillanic acid 1-oxide or a salt thereof which comprises (A) subjecting a penicillin 1-oxide or salt thereof to the penicillin 1-oxide amidase action of (1) a penicillin 1-oxide amidase-producing microorganism of the genus Streptomyces or (2) the mycelium preparation resulting from said microorganism and (B) recovering the resultant 6-aminopenicillanic acid 1-oxide or salt thereof.

3,925,156

MICROBIOLOGICAL PROCESS FOR PREPARING 2-SUBSTITUTED-4-(R)-HYDROXY-CYCLOPENTANE-1,3-IONES

Lung Ting Chang, Elkhart, Ind., and Carol Ann Terry, Cassopolis, Mich., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Dec. 10, 1973, Ser. No. 423,257

Int. Cl.² C07B *29/02*

U.S. Cl. 195—51 R **11 Claims**

1. In a microbiological process for converting a 2-substituted-cyclopentane-1,3,4-trione or a 2-substituted-3-alkoxy-cyclopent-2-ene-1,4-dione substrate into a 2-substituted-

4(R)-hydroxy-cyclopentane-1,3-dione product utilizing a microorganism of the Class Ascomycetes, by incubating the microorganism in a medium having an initial carbohydrate concentration of from 2% to 6% and an initial pH of from 5 to 6 and subsequently adding the substrate to the incubated medium for conversion, the improvement comprising:

maintaining a subsequent carbohydrate concentration of from 0.1 to 1% and a subsequent pH of from 4 to 5 during incubation of the microorganism until a cell concentration of the microorganism of from 20% to 35% is obtained in the medium;

then adding the substrate to the incubated medium at a rate of from 0.4 gram to 1.0 gram per hour per 10 liters and maintaining said subsequent carbohydrate concentration and said subsequent pH of the medium during the entire microbiological conversion of substrate to product.

3,925,157
IMMOBILIZED ENZYMES

James J. Hamsher, Stonington, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 271,159, July 12, 1972, abandoned. This application Dec. 6, 1972, Ser. No. 312,694
Int. Cl.[2] C07G *7/02*
U.S. Cl. 195—63 **22 Claims**

1. A process for preparing an immobilized enzyme which comprises contacting an enzyme with a polymerizable, ethylenically unsaturated monomer until said enzyme is covalently bonded to said monomer and then polymerizing or copolymerizing the enzyme-monomer product thus produced in the presence of a cross-linking agent and an initiator, the polymerizable, ethylenically unsaturated monomer having the formula:

$$CH_2=\underset{\displaystyle R_1}{\overset{|}{C}}-W$$

wherein

R_1 is selected from the group consisting of hydrogen, methyl and chloro;

W is selected from the group consisting of $-COR_2$, $-SO_2Cl$ and p-(chlorosulfonyl)phenyl;

R_2 is selected from the group consisting of

A. hydroxy,
halide,
azido,
acryloyloxy,
lower alkoxy carbonyloxy,
benzenesulfonyloxy, and
N-[(p-diazonium chloride)phenyl]amino; and

B. $-X-(Y-X')_n-Z$

wherein each of X and X′ is selected from the group consisting of —O— and $-NR_3$ wherein R_3 is selected from the group consisting of hydrogen and alkyl containing from 1 to 6 carbon atoms;

Y is selected from the group consisting of alkylene containing from 2 to 3 carbon atoms;

n is an integer from 1 to 2; and

Z is selected from the group consisting of haloacetyl, 2-(4,6-dichloro)-s-triazinyl, p-toluenesulfonyl, p-(halomethyl) benzoyl and cyano;

with the proviso that when Z′ is p-toluenesulfonyl, X′ is —O—.

3,925,158
PROCESS OF MANUFACTURING ENZYME PREPARATION RICH IN LIPASE

Hans Betzing, Horrem, and Dac Lekim, Cologne, both of Germany, assignors to A. Nattermann & Cie. GmbH, Cologne, Germany

Filed Feb. 18, 1975, Ser. No. 550,641
Claims priority, application Germany, Feb. 21, 1974, 2408379; Jan. 30, 1975, 2505887
Int. Cl.[2] C07G *7/026*
U.S. Cl. 195—66 R **4 Claims**

1. In a process of preparing an enzyme preparation rich in lipase by comminution of pancreas tissue, autolysis, removal of fat and aqueous extraction of the tissue, and recovery of the enzyme from the aqueous extract, the improvement wherein: the comminuted pancreas tissue is first partially degreased with a mixture of about 9 parts by volume of chloroform and 1 part by volume butanol, then the partially degreased tissue material is left standing for 24–96 hours at 0° – 4°C to effect autolysis, and then after said aqueous extraction, said recovery is carried out.

3,925,159
BIOLOGICAL INDICATOR AND METHOD FOR ITS PRODUCTION

Eberhard Steiger, Leipzig, Germany, assignor to VEB Kombinat Medizin-und Labortechnik Leipzig, Leipzig, Germany

Continuation-in-part of Ser. No. 367,988, June 7, 1973. This application Jan. 30, 1974, Ser. No. 438,058
Int. Cl.[2] C12K *1/04*
U.S. Cl. 195—73 **10 Claims**

1. Method for the preparation of a biological indicator for the reproducible control of the conducting of chemical sterilizations, comprising suspending a spore sôil in a liquid at a ratio of at least 1.5 ml. of the liquid per g. of the soil, separating the solid constituents from the suspension thereby to obtain a biotope-free germ suspension having a germ concentration no greater than 6000 germs per ml., concentrating the germ suspension to a concentration of at least 10^6 germs per ml. while the germ suspension is not yet packaged, packaging the germ suspension and drying the germ suspension.

3,925,160
METHOD OF PRODUCING AN ANTIBIOTIC

W. Eugene Sanders, Jr., and Christine C. Sanders, both of Omaha, Nebr., assignors to Creighton University, Omaha, Nebr.

Filed Sept. 26, 1974, Ser. No. 509,457
Int. Cl.[2] C12D *9/20*
U.S. Cl. 195—96 **6 Claims**

1. A process for producing the antibiotic substance Enocin having antibacterial activity against group A streptococci and other pantothenate - requiring organisms comprising cultivating *Streptococci salivarius* strain K58 (ATCC No. 31067) in an aqueous growth medium until a substantial amount of Enocin is produced, and recovering the Enocin from said growth medium.

3,925,161
FECAL STREPTOCOCCI SPECIATING MEDIA

Mary M. Galvani, 540 Mississippi River Blvd., St. Paul, Minn. 55116

Filed July 18, 1973, Ser. No. 380,141
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] C12K *1/10*
U.S. Cl. 195—100 **8 Claims**

1. A fecal streptococci speciating media consisting of a mixture of Peptone, Esculin, Ferric Ammonium Citrate Sodium Azide and Bacteriological Gelatin having a pH of 6.8.

2. The media set forth in claim 1 and including Sodium Citrate.

3. The media set forth in claim 1 and the amounts of the said ingredients being in the ranges of: Peptone, 10.0 to 30.0 grams per liter; Esculin, 0.10 to 5.00 grams per liter; Ferric Ammonium Citrate, 0.10 to 3.00 grams per liter; Sodium Azide, 0.01 to 0.50 grams per liter; and Bacteriological Gelatin, 50.0 to 200.00 grams per liter.

7. The process and method of providing a fecal streptococci speciating media including the steps of providing a selection of elements including:

a. Peptone, Esculin, Ferric Ammonium Citrate, Sodium Azide and Bacteriological Gelatin;
b. providing all the dry ingredients in powdered form and thoroughly mixing the same;
c. providing 143.00 grams of the dry, mixed ingredients for mixture in cold distilled water to provide a thoroughly wetted and evenly suspended mixture;
d. slowly heating the mixture to boiling while constantly agitating the same;
e. cooling the mixture immediately after reaching the boiling point;
f. autoclaving the resulting mixture as selected; and
g. adjusting the pH of the mixture to 6.8.

3,925,162
METHOD FOR SIMULTANEOUS DETERMINATION OF ENZYMATIC ACTIVITIES OF ENZYMES

Takashi Kanno, Tokyo, Japan, assignor to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 6, 1973, Ser. No. 385,815
Claims priority, application Japan, Aug. 17, 1972, 47-81818
Int. Cl.² C12K *1/04*
U.S. Cl. 195—103.5 R **23 Claims**

1. A method for the simultaneous determination of enzymatic activities of a plurality of enzymes in a single reaction medium, comprising:

adding a substrate for each of the enzymes to be determined, each substrate being selected such that it is capable of giving an enzymatic reaction with its respective enzyme, it does not interact with the other substrates, reaction products or reagents used and it does not adversely affect the measurement of the enzymatic activity, to an aqueous solution containing a plurality of enzymes to be determined, the enzymes being selected such that the enzymatic conditions of each are similar to each other and they can be reacted with their respective substrates under the same reaction conditions;

simultaneously reacting each of the enzymes with their respective substrates under the optimum reaction conditions with respect to each of the enzymes under which the enzymatic reactions of the plurality of enzymes to be determined take place simultaneously;

measuring simultaneously changes in the absorbance or fluorescence of the resulting reaction system with the lapse of time at a plurality of optional wavelengths which are different from each other and the number of which is equal to the number of enzymes to be determined;

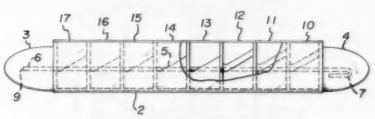
formulating simultaneous equations of the first degree by taking advantage of the proportional relationship, which is independent with respect to each of the enzymes, between the measurement values and the enzymatic activities; and

determining the enzymatic activity of each of the enzymes by the thus formulated equations.

3,925,163
DIAGNOSTIC DEVICE

Thomas Cekoric, Jr., Hopatcong, and Patrick Michael Yananton, Garfield, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 256,984, May 25, 1972, Pat. No. 3,784,448. This application Sept. 24, 1973, Ser. No. 400,080
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² C12K *1/04*
U.S. Cl. 195—103.5 R **6 Claims**



1. A method for innoculating and insuring the biochemical reaction of a test media contained in compartments of a tubular member of a disposable diagnostic device, said disposable device including an innoculation member extending longitudinally through the tubular member via axially aligned openings contained in the walls which define said compartments, said innoculation member including a handle end and an innoculation end; at least one of such compartments containing a media which biochemically reacts under anaerobic conditions, any such last-mentioned compartment being disposed sequentially adjacent to one end of the tubular member which method comprises contacting said innoculation end with isolates obtained from a specimen sample, pulling on said handle end whereby said innoculation member is withdrawn from said tubular member and said innoculation end passes through and hence, contacts all of said test media and permits air to enter the tubular member through the compartment adjacent the inoculation end and reinserting an insertable member into the openings in the walls of any compartment that contain a medium which biochemically reacts under anaerobic conditions, such insertable member being so sized as to pass only through both walls defining any of such last-mentioned compartment.

2. A method as in claim 1 which comprises coating any media which biochemically reacts under anaerobic conditions with a non-porous, pliable material which is solid below 50°C.

4. A method as in claim 1 wherein the innoculation member is provided with a scored portion and the innoculation member is broken at the scored portion after said innoculation member is withdrawn from the tubular member and utilizing one of said broken portions as the said insertable member.

3,925,164
METHOD FOR THE DETERMINATION OF CHOLESTEROL

Klaus Beaucamp; Hans Möllering; Gunter Lang; Wolfgang Gruber, and Peter Roeschlau, all of Tutzing, Upper Bavaria, Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim-Waldhof, Germany

Filed Mar. 25, 1974, Ser. No. 454,522
Claims priority, application Germany, Mar. 28, 1973, 2315501; Apr. 3, 1973, 2316637
Int. Cl.² C12K *1/04*
U.S. Cl. 195—103.5 R **18 Claims**

1. Method of determining total cholesterol or bound cholesterol in a sample, which method comprises treating said sample with cholesterol esterase obtained from a micro-organism, thereby releasing the bound cholesterol, and then determining the resulting cholesterol content of said sample using a standard determinatiion.

3,925,165
APPARATUS FOR CULTURING OF TISSUE CELLS AND MICRO-ORGANISMS

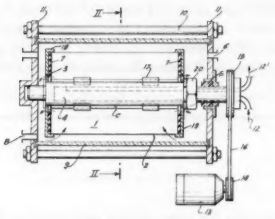
Hans Müller, Im Allmendli, Erlenbach, Zurich, Switzerland

Filed Aug. 13, 1973, Ser. No. 388,036

Claims priority, application Switzerland, Aug. 18, 1972, 12326/72

Int. Cl.² C12B *1/16*

U.S. Cl. 195—127 **11 Claims**



1. In an apparatus for culturing of tissue cells and micro-organisms, a combination comprising a housing; a support mounted in said housing for rotation about an axis; drive means for rotating said support about said axis; a plurality of elongated culture carriers circumferentially spaced from each other about the periphery of said support and each elongated in a direction parallel to said axis and partly bounding with an adjacent carrier a space that is elongated lengthwise of said axis, and having exposed surfaces on which respective cultures are to grow, and longitudinally spaced ends; connecting means for releasably connecting said carriers with said support; and a pair of end plates located at the respective ends of said carriers.

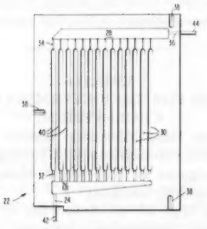
3,925,166
AUTOMATED SYSTEM FOR THE DETERMINATION OF BACTERIAL ANTIBIOTIC SUSCEPTIBILITIES

Philip Blume, Minneapolis, Minn., assignor to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

Filed Sept. 6, 1974, Ser. No. 503,744

Int. Cl.² C12K *1/04*

U.S. Cl. 195—139 **7 Claims**



1. A sample plate for testing antibiotic susceptibility of bacterially impregnated gels comprising:

a transparent plate having upper and lower surfaces;

a plurality of parallel grooves in said plate each of said grooves having an outlet end and an inlet end;

first and second manifolds disposed in said plate respectively at said inlet end and said outlet end of said parallel grooves;

first connecting means for connecting each of said inlet ends of said parallel grooves to said first manifold;

second connecting means for connecting said outlet ends of said parallel grooves to said second manifold;

an inlet bore connected to said first manifold through which a solution of agar may be introduced to said first manifold;

an aspiration bore connected to said second manifold, said aspiration bore being adapted to be connected to a means for applying a suction to said aspiration bore, and

a transparent covering means, sealingly engaging said upper surface of said transparent plate, for forming, with said first and second connecting means and said parallel grooves, a plurality of sealed tube-like channels connecting said first and second manifolds, and for scaling said manifolds.

3,925,167
MULTI-STAGE DISPOSABLE STILL

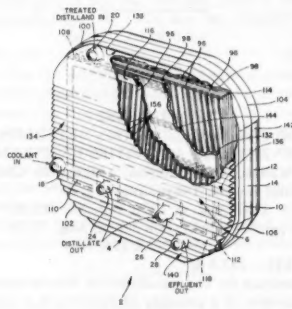
Franklin A. Rodgers, Brookline, Mass., assignor to Pactide Corporation, Cambridge, Mass.

Filed Dec. 22, 1972, Ser. No. 317,624

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² B01D *1/26, 3/00*

U.S. Cl. 202—174 **27 Claims**



1. A disposable still structure, including:

an array of alternating vapor-impermeable and vapor-permeable stacked membranes in uniformly spaced layers means defining a plurality of open channels on at least one surface of alternate ones of said impermeable membranes extending generally in a reference direction but canted in a first direction with respect to said reference direction;

means defining a plurality of open channels on at least one surface of each of said impermeable membranes intermediate said alternate impermeable membranes and extending generally in said reference direction but canted with respect to said reference direction in a second direction;

means for sealing discrete portions of adjacent impermeable and permeable membranes to close both said pluralities of open channels to define at least a plurality of channels for receiving distilland on one side of said plurality of permeable membranes; and

means for maintaining a temperature differential across said permeable membranes whereby vapor from said distilland may pass through said permeable membranes and be condensed as distillate on the other side thereof.

18. A multi-stage distillation device of the type useful in distilling potable water from saline water by passing heated distilland over one surface of a microporous vapor-permeable, liquid-impermeable membrane and diffusing the vapor of said distilland through the pores of said membrane to the other

side thereof where it may be cooled and condensed as potable water, including as elements in each of said multi-stages:

a first liquid and vapor-impermeable membrane having at least one corrugated surface;

a second liquid and vapor-impermeable membrane having a corrugated surface disposed facing a corrugated surface of said first impermeable membrane;

a vapor-permeable, liquid-impermeable membrane compressively sandwiched between said first and second impermeable membranes; and

means for preventing the facing corrugated surface of said impermeable membranes from nesting together, thereby preventing said vapor permeable membrane from being compressively urged into said corrugations;

wherein the corrugations in said first impermeable membrane are canted in one direction with respect to a reference and the corrugations in said second impermeable membrane are canted in a direction opposite said one direction.

3,925,168

METHOD OF MONITORING THE ACTIVE ROUGHENING AGENT IN A COPPER PLATING BATH

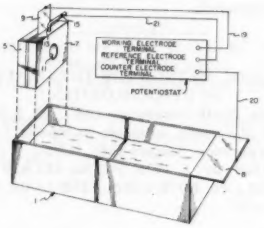
Louis P. Costas, Cheshire, Conn., assignor to Anaconda American Brass Company, Waterbury, Conn.

Filed July 26, 1972, Ser. No. 275,426

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] G01N 27/46; C23B 5/20

U.S. Cl. 204—1 T **3 Claims**



1. A method of determining the amount of active roughening agent in a plating bath comprising

a. submerging a test cathode in a quantity of the bath to be tested;

b. shielding the test cathode from exposure to the bath except for a defined area;

c. placing a reference electrode adjacent to the cathode;

d. maintaining either the voltage difference between the cathode and reference electrode substantially constant or the current density in the defined area of the cathode substantially constant;

e. measuring said current density or said voltage difference whichever is not held constant;

f. thereafter repeating steps (d) and (e) with selected voltage differentials or selected current densities with baths having varying known active roughening agent content; and

g. finally determining the amount of such agent in an unknown bath by

i. controlling the voltage applied or controlling the current density;

ii. measuring the current density or voltage differential whichever is not controlled; and

iii. comparing the data with said prior measurements of (e) above.

3,925,169

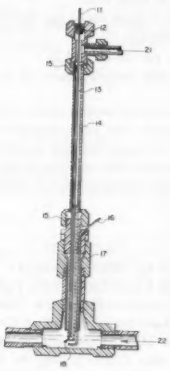
ACTIVE GRIGNARD ELECTRODE AND PROCESS

Charles L. Baimbridge, Sweeny; James R. Minderhout, Lake Jackson; Robert W. Bearman, Lake Jackson, and Donald E. Carpenter, Lake Jackson, all of Tex., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Mar. 19, 1973, Ser. No. 342,346

Int. Cl.[2] G01N 27/46; C25B 3/12

U.S. Cl. 204—1 T **6 Claims**



1. A method of continuously monitoring the concentration of Grignard reactant in a Freeport Process cell for producing organolead compounds which comprises measuring the potential drop between a reference half cell comprising an electrode selected from the group consisting of lead and zinc metal in anhydrous ether solution and a platinum group sample electrode in process Grignard reactant coupled to said reference half cell through a bridge means.

3,925,170

METHOD AND COMPOSITION FOR PRODUCING BRIGHT PALLADIUM ELECTRODEPOSITIONS

Robert M. Skomoroski, Paterson, N.J., and Robert G. Zobbi, Southbury, Conn., assignors to American Chemical & Refining Company, Inc., Waterbury, Conn.

Filed Jan. 23, 1974, Ser. No. 435,844

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] C25D 3/56

U.S. Cl. 204—43 N **15 Claims**

1. In an aqueous bath for the electroplating of palladium, the combination consisting essentially of:

A. 0.02–0.25 gram mole per liter of palladium ion;

B. 0.9–3.6 gram moles per liter of ammonium hydroxide;

C. 0.1–0.7 gram mole per liter of a soluble electrolyte selected from the group consisting of alkali metal and ammonium sulfates, sulfamates, phosphates, nitrates, nitrites and mixtures thereof;

D. a soluble metallic brightener selected from the group consisting of 0.002–0.04 gram mole per liter of cobalt ion, 0.004–0.02 gram mole per liter of nickel ion and mixtures thereof providing 0.003–0.068 gram mole per liter of metal ions; and

E. up to 6×10^{-4} gram mole per liter of cetyltrimethylammonium bromide;

said bath having a pH of 7.5–11.0.

8. In the method of electroplating palladium deposits upon a workpiece, the steps comprising:

A. immersing a workpiece having a conductive surface in an aqueous bath consisting essentially of:
1. 0.02–0.25 gram mole per liter of palladium ion;
2. 0.9–3.6 gram moles per liter of ammonium hydroxide;
3. 0.1–0.7 gram mole per liter of a soluble electrolyte selected from the group consisting of alkali metal and ammonium sulfates, sulfamates, phosphates, nitrates, nitrites and mixtures thereof;
4. a soluble metallic brightener selected from the group consisting of 0.002–0.04 gram mole per liter of cobalt ion, 0.004–0.02 gram mole per liter of nickel ion and mixtures thereof providing 0.003–0.068 gram mole per liter of metal ions; and
5. up to 6×10^{-4} gram mole per liter of cetyltrimethylammonium bromide;

said bath having a pH of 7.5–11.0;

B. maintaining the temperature of said bath at 26°–60° Centigrade;

C. applying a potential across said workpiece and an anode inert to said bath, said potential providing a current density of 0.05–2.0 amperes per square decimeter and the anode to cathode surface ratio being 1.0–5.0:1.0; and

D. removing said workpiece from said bath.

3,925,171
METHOD FOR ELECTROCHEMICAL PASSIVATION OF TINPLATE AND ELECTROLYTE FOR USE THEREIN

Franz Jargon, Schwanewede; Erich Maschke, Bremen, and Rudolf Eylens, Leuchtenberg, all of Germany, assignors to Klockner-Werke AG, Duisburg, Germany

Filed May 2, 1974, Ser. No. 466,247

Claims priority, application Germany, May 9, 1973, 2323336

Int. Cl.[2] C25D *11/38*

U.S. Cl. 204—56 R **8 Claims**

1. A method for treating a material having a tin-containing surface to passivate and improve the corrosion resistance of the said surface which comprises making the material a cathode in an aqueous hexavalent chromium electrolyte consisting essentially of an aqueous solution of an alkali-metal dichromate in an amount of at least 20 and at most 25 grams per liter, an alkali-metal acetate in an amount of at least 5 and at most 10 grams per liter, and chromium trioxide in an amount of at least 4 and at most 6 grams per liter, the said electrolyte having a hydrogen-ion concentration corresponding to a pH between 4.0 and 5.0 and an electrical conductivity of at least 28,000 micromhos per centimeter at a temperature of 50°C, and passing an electric current through the material and the electrolyte until an amount of chromium-containing film is deposited upon the said surface that is sufficient to improve the corrosion resistance of the said material.

3,925,172
ELECTROCHEMICAL OXIDATION AND REDUCTION

John Davidson Voorhies, New Canaan, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Feb. 14, 1972, Ser. No. 226,306

Int. Cl.[2] C25B *3/00*; **C07C** *85/00, 39/08, 107/00*

U.S. Cl. 204—72 **5 Claims**

1. A process for electrolyzing material capable of being oxidized or reduced comprising

A. forming a liquid permeable mixture of

a. conductor particles, said conductor particles being of small particle size, electrically conductive, and insoluble in and unreactive to the electrolyte solution used in combination therewith, and

b. material to be electrolyzed, said material being insoluble in and unreactive to the electrolyte solution used in combination therewith, in the physical form of particles of small particle size, and capable of being oxidized or reduced to yield products which are soluble in the electrolyte solution,

in contact with an electrode and electrolyte solution, said electrolyte solution being capable of conducting electricity and of dissolving the products produced on oxidizing or reducing said material being electrolyzed but being incapable of dissolving said material to be electrolyzed or said conductor particles;

B. immersing a counter-electrode in said electrolyte solution out of contact with said liquid permeable mixture of particles; and

C. flowing electricity in a single direction between said electrode and said counter-electrode to oxidize or reduce said electrolyzable material thereby forming a solution in said electrolyte of the resultant oxidized or reduced material.

3,925,173
ELECTROCATALYTIC HYDROGENATION PROCESS

Klaus Junghans, Berlin, Germany, assignor to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

Filed May 2, 1974, Ser. No. 466,172

Claims priority, application Germany, May 4, 1973, 2323091

Int. Cl. C25B *3/04*; **C07C** *167/12, 169/00*

U.S. Cl. 204—73 R **9 Claims**

1. A process for the stereospecific selective electrolytic hydrogenation of a carbon-carbon, non-aromatic multiple bond of an unsaturated steroid having an aromatic ring and which is reducible to a mixture of stereoisomers, while leaving the aromatic ring intact, which comprises subjecting an acidic solution of the unsaturated steroid to electrolysis in a divided cell employing a cathode whose surface is a finely divided metal hydrogenation catalyst until the carbon-carbon multiple bond is hydrogenated.

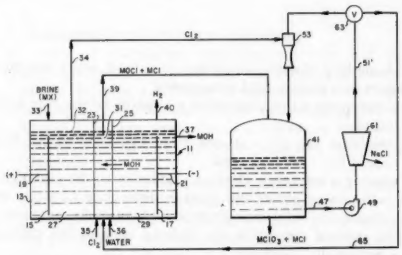
3,925,174
ELECTROLYTIC METHOD FOR THE MANUFACTURE OF HYPOCHLORITES

Jeffrey D. Eng, North Vancouver, and Cyril J. Harke, Burnaby, both of Canada, assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Nov. 1, 1973, Ser. No. 411,620

Int. Cl.[2] C25B *1/26*; **C01B** *11/06*; **C25B** *13/08*; **B01K** *1/00*

U.S. Cl. 204—95 **8 Claims**



1. A method for electrolytically manufacturing a hypochlorite which comprises electrolyzing an aqueous solution containing chloride ions in an electrolytic cell having at least three compartments therein, being anode and cathode compartments and at least one buffer compartment, an anode, a cathode, at least one cation-active permselective membrane selected from the group consisting of a hydrolyzed copolymer of a perfluorinated hydrocarbon and a fluorosulfonated perfluorovinyl ether, and a sulfostyrenated perfluorinated ethylene propylene polymer, defining a cathode-side wall of a buffer compartment between the anode and cathode, an anode-side wall of a buffer compartment being defined by such a cation-active permselective membrane or a porous

diaphragm, and such walls, with walls thereabout, defining anode, cathode and buffer compartments, while feeding gaseous chlorine into a buffer compartment and regulating the rate of feed thereof and reaction conditions to produce hypochlorite in the buffer compartment.

3,925,175
ELECTRODIALYSIS OF FIXER CONTAINING SOLUTIONS

Richard S. Fisch, and Norman Newman, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 24, 1973, Ser. No. 391,509

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C25C *1/12*

U.S. Cl. 204—109 **2 Claims**

1. A process for the removal of silver and halide from a thiosulfate solution comprising thiosulfate, silver ions, and halide ions, said process comprising passing the thiosulfate containing solution through the cathode chamber of an electrodialysis cell which comprises:
   1. an anode
   2. a cathode
   3. an anionic semipermeable membrane separating the anode and cathode and forming two chambers within the cell, and
   4. a power source connected to the anode and cathode, passing an aqueous solution of an electrode active oxidizable species through the anode chamber, and with the power source applying a voltage differential across the anode and cathode.

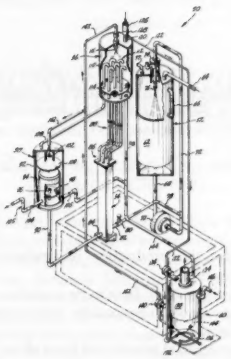
3,925,176
APPARATUS AND METHOD FOR ELECTROLYTIC SEWAGE TREATMENT

Adolph P. Okert, N. 2916 Woodruff Road, Spokane, Wash. 99206

Filed Oct. 10, 1973, Ser. No. 405,151

Int. Cl.² C02B *1/82;* **B03D** *1/02;* **C02C** *5/12*

U.S. Cl. 204—152 **8 Claims**



1. A method of processing sewage, comprising
macerating said sewage,
screening the macerated sewage through a screen,
pasing the screened sewage through an electrolytic cell comprising an anode and a cathode between which said sewage passes,
applying a voltage to said anode and cathode to electrolytically treat the sewage with the production of a gaseous foam within said cell,
withdrawing said foam from said cell to separate the foam from the remainder of the sewage, and
breaking up said foam to release gases contained therein.

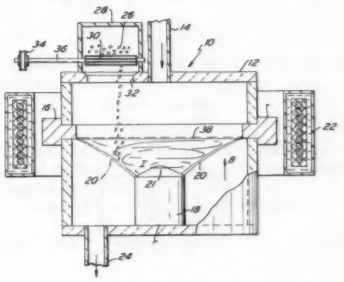
3,925,177
METHOD AND APPARATUS FOR HEATING SOLID AND LIQUID PARTICULATE MATERIAL TO VAPORIZE OR DISASSOCIATE THE MATERIAL

Melvin J. Kofoid, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 30, 1973, Ser. No. 327,914

Int. Cl.² C01G *27/04;* **C01F** *7/30*

U.S. Cl. 204—164 **27 Claims**



1. A process for separating the constituent species of solid or liquid particulate material by increasing the residence time of the material in a high temperature zone, comprising the steps of:
   revolving an electric arc extending between two electrodes to define a surface of revolution, said surface of revolution including within its boundaries an arc volume;
   directing said particulate material so as to be incident upon said surface of revolution;
   revolving said arc at a rate sufficient to make the surface of revolution impervious to particulate material in solid or liquid form and to heat the particulate material within the arc volume so that at least a portion of the particulate material is vaporized and dissociated into constituent species; and
   removing at least one of the dissociated constituent species from the arc volume.

3,925,178
CONTACT LENSES

Hymie D. Gesser, 218 Girton Blvd., Winnipeg 29, Manitoba, and Robert E. Warriner, 106 Longsdale Drive, Winnipeg 22, Manitoba, both of Canada

Continuation of Ser. No. 29,635, April 17, 1970, abandoned, which is a continuation-in-part of Ser. No. 449,297, April 19, 1965. This application June 7, 1974, Ser. No. 477,265

Int. Cl.² B01K *1/00;* **B01J** *1/10*

U.S. Cl. 204—165 **5 Claims**

1. A process of treating a plastic contact lens to make the total lens surface hydrophilic without changing the optical characteristics or the physical dimensions of the lens, which comprises:
   placing the lens in a vacuum chamber containing water vapor;
   subjecting the molecules of water vapor to the action of a source of an electrical discharge or a radio frequency discharge;
   subjecting substantially the total lens surface to the excited molecules of the water vapor in a vacuum in the range of

about 1 micron to 1 millimeter pressure of mercury; and maintaining the lens surface in contact with the excited molecules of the water vapor until the lens surface is wettable by human tear fluid.

3,925,179

METHOD OF ELECTRICALLY DEPOSITING GLASS PARTICLES ON OBJECTIVE BODY

Takeshi Yamamoto, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

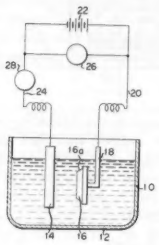
Filed Feb. 27, 1973, Ser. No. 336,345

Claims priority, application Japan, Mar. 2, 1972, 47-21734

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] C25D *13/02, 13/12*

U.S. Cl. 204—181 **6 Claims**



1. A method of electrically depositing glass particles on a semiconductive body, comprising the steps of disposing the semiconductive body and an electrode in spaced relationship within a suspension having glass particles suspended in a non-ionized electrically conductive solvent consisting essentially of a first organic solvent to which the glass particles are lyophobic and a second organic solvent to which the glass particles are lyophilic, said suspended glass particles being negatively charged by said solvent, and applying a dc voltage across said semiconductive body and said electrode such that said semiconductive body has a positive polarity.

3,925,180

ELECTRODEPOSITION PROCESS USING A NOVEL PIGMENT DISPERSANT

Robert D. Jerabek, Glenshaw, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 248,752, April 28, 1972, Pat. No. 3,842,111, which is a continuation-in-part of Ser. No. 193,590, Oct. 28, 1971. This application Jan. 3, 1974, Ser. No. 430,450

Int. Cl.[2] C25D *13/06, 13/10*

U.S. Cl. 204—181 **6 Claims**

1. A method of electrocoating an electrically-conductive surface serving as a cathode in an electrical circuit comprising said cathode, an anode and an aqueous electrodepositable composition wherein the electrodepositable composition comprises an aqueous dispersion of:

A. an acid-solubilized polyamine group-containing resin and

B. a pigment paste comprising

1. an adduct comprising the reaction product of:
   a. a fatty glycidyl ether or ester; and
   b. a secondary amine or tertiary amine salt; said adduct being at least partially neutralized with a water-soluble acid; and
2. a pigment dispersed therewith.

3,925,181

CATHODIC ELECTROCOATING PROCESS

Vincent D. McGinniss, Valley City, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed Oct. 31, 1974, Ser. No. 519,409

Int. Cl.[2] C25D *13/10*

U.S. Cl. 204—181 **2 Claims**

1. In a process for electrodeposition of a heat-curable electrocoating composition containing a polymer having pendant amine groups and a cross-linking agent in an aqueous dispersion onto a cathode substrate disposed within an aqueous electrocoating bath, said polymer being cross-linkable upon subsequent heating of said electrocoated cathode substrate, the improvement comprising:

a. providing said electrocoating composition containing
   i. a polymer having at least about 5% pendant primary or secondary amine groups, said amine groups being protonated with acid to render said polymer water dispersible in said bath and
   ii. at least about 5% bis-maleimide cross-linking agent by weight of said polymer;
b. applying an electromotive potential through said bath to electrodeposit said polymer and said cross-linking agent onto said cathode substrate, said pendant amine groups of said polymer becoming de-protonated thereby; and
c. heating said electrocoated cathode substrate, said bis-maleimide cross-linking said polymer by addition polymerization with said de-protonated pendant amine groups to form a heat-cured electrodeposited coating.

3,925,182

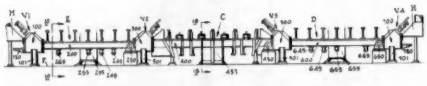
METHOD FOR CONTINUOUS PRODUCTION OF SPUTTER-COATED GLASS PRODUCTS

Donald C. Carmichael; Douglas L. Chambers, and Chong T. Wan, all of Columbus, Ohio, assignors to Shatterproof Glass Corporation, Detroit, Mich.

Division of Ser. No. 400,561, Sept. 25, 1973, Continuation-in-part of Ser. No. 305,877, Nov. 13, 1972, abandoned, which is a continuation of Ser. No. 70,143, Sept. 8, 1970, abandoned. This application July 8, 1974, Ser. No. 486,492

Int. Cl.[2] C23C *15/00*; **C03C** *17/06*; **C23C** *13/08*

U.S. Cl. 204—192 **14 Claims**



1. A method for the production of sputter-coated glass sheets, which comprises:

a. freely supporting a glass sheet to be coated in a horizontal position on the upper substantially continuous surface of a support platen,
b. freely supporting said platen and glass sheet horizontally upon a conveyor means,
c. conveying the platen and sheet horizontally into a coating chamber,
d. maintaining a predetermined pressure in said coating chamber,
e. sputter-coating a continuous film of a selected coating material on the upper surface of said sheet when supported in the coating chamber, and
f. removing the platen and coated sheet from said chamber.

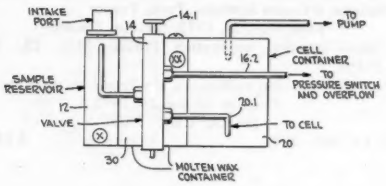
3,925,183
GAS DETECTING AND QUANTITATIVE MEASURING DEVICE

Harry G. Oswin, Chauncey, and Keith F. Blurton, Ossining, both of N.Y., assignors to Energetics Science, Inc., Elmsford, N.Y.

Division of Ser. No. 263,531, June 16, 1972, Pat. No. 3,824,168, and a continuation-in-part of Ser. Nos. 172,486, Aug. 17, 1971, Pat. No. 3,824,167, and Ser. No. 88,267, Nov. 10, 1970, Pat. No. 3,776,832. This application Jan. 28, 1974, Ser. No. 436,979

Int. Cl.² G01N *27/46*

U.S. Cl. 204—195 R **4 Claims**



1. A gas detecting and measuring unit comprising in combination intake means, a gas sample reservoir, an electrochemical cell, means for drawing a gas through said intake means and into said electrochemical cell at a controlled flow rate, and read-out means for reading the quantity of said detected gas, at least said gas sample reservoir and said electrochemical cell being in heat communication with a heat reservoir means for maintaining said gas sample reservoir and electrochemical cell at a predetermined, substantially constant temperature; said heat reservoir means for providing constant temperature for at least a time sufficient for performing a measurement without requiring additional heat energy input, said heat reservoir means comprising a high latent heat of fusion material adapted to be heated to at least its melting point prior to use. **3.** The gas detecting and measuring unit of claim **1** wherein the material having a high latent heat of fusion comprises wax having a melting point above about 50°C.

3,925,184
ELECTROLYTIC SYSTEM FOR RECOVERING METAL FROM CHEMICAL SOLUTIONS WITH CONTROLLED PLATING CURRENT

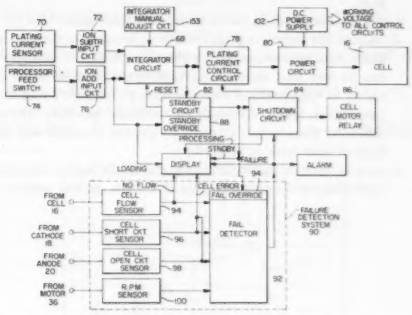
Ellis K. Cave, Garland, Tex., assignor to Gus A. Buder, Eureka, Mo.

Filed May 30, 1974, Ser. No. 474,777

Int. Cl.² C25C *7/00*

U.S. Cl. 204—229 **18 Claims**

1. A system for recovering silver from a chemical fixing solution in a photographic film processing system comprising an electrolytic cell having an anode and cathode adapted to be immersed in the chemical fixing solution of said film processing system, a variable current source operatively connected to the electrodes of said electrolytic cell to provide plating current therethrough, computing means to continuously compute the level of silver ions in said fixing solution from the amplitude of said plating current and the amount of film processed by the system and to generate an indication representing said level of said ions, said computing means changing the value of said indication in one direction in response to film being processed in said film processing system and changing the value of said indication in the opposite direction responsive to the amplitude of plating current flowing in said electrolytic cell the rate of change of said indication corresponding to said amplitude of plating current, and means to control said variable current source in accordance with said indication generated by said computing means to vary said plating current



through a plurality of levels in accordance with the value of said indication.

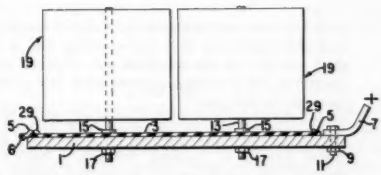
3,925,185
PREVENTION OF CREVICE CORROSION

Joseph J. Lint, Bedford, Ohio, assignor to Electronor Corporation, Panama City, Panama

Filed Apr. 3, 1974, Ser. No. 457,603

Int. Cl.² C25B *9/00*

U.S. Cl. 204—252 **12 Claims**



1. In a diaphragm cell comprising a cell base with anodes mounted thereon and covered with a protective blanket and a cell can with cathodes mounted therein, the improvement comprising providing in the area of the cell base where crevice corrosion normally occurs a mixture of metallic powder nickel and nickelous oxide in the protective blanket or gasket sealing means.

3,925,186
ELECTROLYSIS CELL WITH VERTICAL BIPOLAR ELECTRODES

Umberto Giacopelli, Solvay, Leghorn, Italy, assignor to Solvay & Cie, Belgium

Filed Dec. 26, 1972, Ser. No. 318,640

Claims priority, application Belgium, Dec. 23, 1971, 112096

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

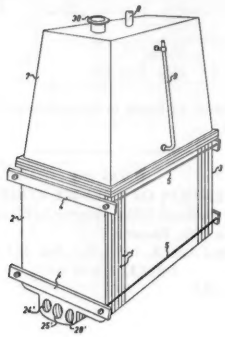
Int. Cl.² C25B *13/00*

U.S. Cl. 204—256 **3 Claims**

1. A bipolar filter press type diaphragm electrolyser for the production of chlorine, hydrogen and caustic alkali by the electrolysis of a solution of an alkali metal chloride, said electrolyser comprising:

a. a plurality of vertical elementary cells disposed face-to-face, connected in series and each having an anode, a cathode, a diaphragm between said anode and cathode and at least one peripheral frame made of insulating material and having openings through the upper part thereof;

b. means defining a tank above said cells for holding said solution comprising a partition tightly overlying all the frames and insulated from the latter and having holes and apertures therein, and a lid tightly fitted over said partition;
c. means for feeding said solution to said tank;
d. means for supplying said solution from said tank to said cells, said means including channels in said frames opening at one end inside said tank through said holes provided in the partition and opening at the other end in the respective cells through a bottom portion thereof, whereby the electric current by-passed through said solution in said tank is limited;
e. means for evacuating chlorine out of the cells, said means including said openings provided through the upper part



of the frames, said apertures provided through the partition and registering with said openings and at least one duct attached to the partition and disposed about said apertures and extending upward from said partition and beneath the lid; and
f. means for evacuating hydrogen and caustic alkali out of the cells, each of said cells having at least one peripheral frame having an opening through a bottom portion thereof, and said means for evacuating caustic alkali out of the cells comprising, for each cell, a U-shaped tube of insulating material which extends upward into the cell, doubles back on itself and opens at one end in a bottom portion of the cell, and at the other end in said opening provided through the bottom of the peripheral frame of the cell, the openings of all the peripheral frames of the cells registering to form a duct for the caustic alkali.

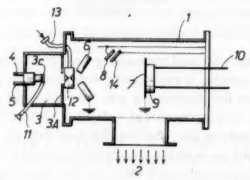
2. A diaphragm electrolyser for the production of chlorine, hydrogen and caustic alkali by the electrolysis of a solution of an alkali metal, said electrolyser comprising:
a. a plurality of vertical elementary cells each having an anode, a cathode and a diaphragm between said anode and cathode, said cells being disposed face-to-face and being connected in series;
b. means defining a tank above said cells for holding said solution comprising a partition overlying said cells and electrically insulated from the latter and having apertures therein and a lid tightly fitted over said partition;
c. means for feeding said solution to said tank;
d. means for supplying said solution from said tank to said cells, said means including, for each cell, a separate feed duct of insulating material extending substantially over the whole height of the cell and opening at one end in the tank and opening at the other end in the cell through a bottom portion of the cell, whereby the electric current by-passed through said solution in said tank is limited;
e. means for evacuating chlorine out of the cells, said means including, said apertures provided through the partition and communicating with the cells and at least one duct attached to the partition and disposed about said apertures and extending upward from said partition and beneath the lid; and
f. means for evacuating hydrogen and caustic alkali out of the cells, each of said cells having at least one peripheral frame each having an opening through a bottom portion thereof, and said means for evacuating hydrogen out of the cells comprising, for each cell, a tube extending upward into the cell and opening, at one end, in the upper part of the cell and, at the other end, in said opening provided through the bottom of the peripheral frame of the cell, the openings of all the peripheral frames of the cells registering to form a duct for the hydrogen.

3,925,187

APPARATUS FOR THE FORMATION OF COATINGS ON A SUBSTRATUM

Jacques Léon Bernard, Toulouse, France, assignor to Centre National d'Etudes Spatiales, Paris, France

Filed Mar. 21, 1972, Ser. No. 236,609
Claims priority, application France, Mar. 25, 1971, 71.10598
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] C23c *15/00*
U.S. Cl. 204—298 **5 Claims**



1. Apparatus for forming a thin coating of material on a substratum, including an enclosure which will withstand a high vacuum, said enclosure being partitioned into a first chamber containing a duoplasmatron, an intermediate chamber and a third chamber, said duoplasmatron including activation means for delivery of ions and inlet means for feeding said duoplasmatron with gas, the intermediate chamber being positioned so as to allow the transit therethrough of ions from said duoplasmatron into said third chamber, said third chamber containing a target device, a substratum device, and a set of ion focusing electrodes for directing the ions entering said third chamber to said target whose ejected particles are deposited onto said substratum, and means for supplying from a gas source a gas capable of reacting with the material of said target and a small passage for connecting said gas source with said intermediate chamber so as to introduce a small amount of reacting gas into said intermediate chamber.

3,925,188 AL JAB

PRODUCTION OF HYDROGEN FOR USE IN COAL LIQUEFACTION

George R. Lester, Park Ridge, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 236,771, March 22, 1972, abandoned. This application Jan. 17, 1974, Ser. No. 434,153
Int. Cl.[2] C10G *1/04*
U.S. Cl. 208—8 **6 Claims**

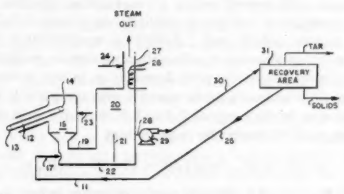
1. In the liquefaction of coal by reaction thereof with hydrogen, the process which comprises separating from the products of the coal liquefaction a liquid comprising polycyclic aromatic, polycyclic hydroaromatic and alkylaromatic hydrocarbons, reacting sufficient amounts of said liquid and steam in contact with a dealkylation catalyst to form substantially all of the hydrogen required in the aforesaid coal liquefaction

step, separating a hydrogen-containing gas from the resultant effluent and supplying to the coal liquefaction step a sufficient quantity of said gas to provide substantially all of the hydrogen requirements for the coal liquefaction.

3,925,189
PIPELINE PROCESSING OF OIL-CONTAINING SOLIDS TO RECOVER HYDROCARBONS

Moye Wicks, III, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 720,773, April 12, 1968, abandoned. This application Jan. 29, 1971, Ser. No. 111,132
Int. Cl. C10g *1/04*
U.S. Cl. 208—11 **8 Claims**



1. An improved method of pipeline transporting and recovering hydrocarbons from tar sands comprising: mixing tar sands with sufficient solvent to form a tar sands-solvent slurry; holding the slurry while disengaging vapors therefrom; excluding air from said process during both the steps of mixing the tar sands with solvent, and while disengaging said vapors; and pipeline transporting said tar sands-solvent slurry; utilizing a pipeline between 8 and 24 inches in diameter, as a reactor by forming a tar sand-solvent slurry and injecting and maintaining the slurry at a critical velocity of between 3 and 20 feet per second into a pipeline, said pipeline being positioned uphill at an angle of between 5° and 7° to the horizontal, thereby effecting increase of solid holdup and residence time in the pipeline so as to effect maximum leaching and extraction of the hydrocarbons from the slurry by the time the slurry reached the terminal end of the pipeline.

3,925,190
PREHEATING OIL SHALE PRIOR TO PYROLYSIS THEREOF

John A. Whitcombe, Los Angeles, Calif.; Kenneth D. Van Zanten, Littleton, Colo., and George C. Kane, Pacific Palisades, Calif., assignors to The Oil Shale Corporation, Los Angeles, Calif.

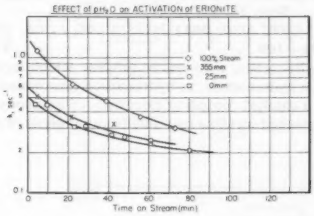
Filed July 29, 1974, Ser. No. 492,447
Int. Cl.² C10G *1/02*
U.S. Cl. 208—11 **8 Claims**

1. A process for preheating oil shale to a temperature in the order of 400°F to 650°F prior to the pyrolysis thereof in a retort which comprises heating the oil shale in a series of at least two dilute phase fluidized beds by entraining partially preheated oil shale in the final dilute phase fluidized bed with hot flue gas to provide oil shale preheated to between about 400°F and 650°F for introduction into the retort and partially cooled flue gas containing entrained oil shale fines and hydrocarbon vapors, passing the partially cooled flue gas through an incineration zone and incinerating in the presence of combustion products the entrained oil shale fines and hydrocarbon vapors emanating from the final dilute phase fluidized bed to provide a portion of the fuel requirement to reheat the flue gas, cooling the flue gas from the incineration zone and entraining crushed raw oil shale in a first dilute phase fluidized bed with the cooled flue gas from the incineration zone to provide partially preheated oil shale for subsequent introduction into the final dilute phase fluidized bed and cooled flue gas.

3,925,191
HYDROCARBON CONVERSION OVER ACTIVATED ERIONITE

William P. Burgess, Hopewell, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed July 17, 1974, Ser. No. 489,952
Int. Cl.² C10G *13/04, 37/06;* **B01J** *29/28*
U.S. Cl. 208—111 **8 Claims**



1. An improved process for the shape selective conversion of straight-chain hydrocarbons from a hydrocarbon feed which comprises the selective conversion of said feed by contact, at elevated temperature and pressure and in the presence of hydrogen, with a catalyst comprising a crystalline aluminosilicate erionite, the erionite having no hydrogenation-dehydrogenation metal associated therewith and having been prepared by the steps of comprising (a) exchange with the ammonium cation, (b) exposing it to 100% steam at elevated temperatures and (c) reexchanging with the ammonium cation.

3,925,192
REMOVING HEAVY METAL IONS FROM WATER

John M. Randall, El Cerrito; Earl Hautala, Martinez; Anthony C. Waiss, Jr., Pinole, and Judith A. Kuhnle, Alameda, all of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 5, 1974, Ser. No. 495,018
Int. Cl.² B01D *15/00*
U.S. Cl. 210—38 **2 Claims**

1. A method for removing dissolved heavy metal ions from water containing the same, which comprises contacting said water with a formaldehyde-modified tree bark, said bark being modified solely by reaction with 15-20% formaldehyde based on the weight of bark, at 50–70° C. for 1–3 hours under acidic conditions so that the physical integrity of said tree bark is retained.

2. The method of claim **1** wherein the tree bark is hemlock bark.

3,925,193
REMOVAL OF FLUORIDES FROM CATALYTIC REACTOR FEED

George J. Constantikes, and Joe Van Pool, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 10, 1974, Ser. No. 513,825
Int. Cl.² C10G *25/00*
U.S. Cl. 208—91 **10 Claims**

1. In a catalytic process for treating hydrocarbon feedstock said process using a catalyst sensitive to fluorides, a method for pretreating process feedstock containing a maximum of about 20 parts per million fluorides, said method comprising contacting said feedstock with an adsorbent consisting essentially of alumina at a temperature in the range of about 340° to 480°F thereby reducing the fluoride content of said feed-

stock to less than one part per million of the hydrocarbon mixture.

3,925,194

HYDROCARBON CONVERSION WITH CATALYST OF SBF_5 ON SILICA

Paul G. Rodewald, Rocky Hill, and Darrell D. Whitehurst, Titusville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 418,153, Nov. 21, 1973. This application Sept. 25, 1974, Ser. No. 508,930

Int. Cl.[2] C07C *5/30*; **B01J** *23/18*; **C10G** *11/08*, *13/08*

U.S. Cl. 208—109 **9 Claims**

1. A hydrocarbon conversion process which comprises contacting a hydrocarbon, at hydrocarbon conversion conditions, with a catalyst consisting essentially of antimony pentafluoride deposited on silica resulting from pyrolysis of methylated silica.

3,925,195

HYDROCARBON CRACKING PROCESS USING ZEOLITE MIXTURES

Julius Scherzer, Columbia, and Edwin Wolf Albers, Annapolis, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 267,907, June 30, 1972, abandoned. This application Nov. 15, 1973, Ser. No. 416,130

Int. Cl.[2] C10G *11/04*; **B01J** *29/08*, *29/18*

U.S. Cl. 208—120 **5 Claims**

1. A method for the catalytic cracking of hydrocarbons which comprises contacting a hydrocarbon feedstock with a catalyst comprising

a. rare earth-hydrogen type Y zeolite,

b. a second zeolite consisting of exchanged mordenite having the general formula M-mordenite wherein M is selected from the group consisting of hydrogen, rare earth, cobalt, nickel and group II cations, under catalytic cracking conditions and recovering the products formed thereby.

3,925,196

REFORMING PROCESS

John H. Sinfelt, Berkeley Heights, and James L. Carter, Chatham, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 111,695, Feb. 1, 1971, Pat. No. 3,789,020. This application Oct. 31, 1973, Ser. No. 411,483

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] C10G *35/06*

U.S. Cl. 208—139 **15 Claims**

1. A process for the reforming of naphtha feed stocks which comprises contacting a naphtha feed stock and hydrogen at reforming conditions with a catalyst composition comprising a physical mixture of a metal component supported on a nonmetallic refractory material and additional nonmetallic refractory material, said supported metal component comprising a combination of Group VIII metals or a combination including at least one Group VIII metal and at least one metal selected from Group IB or VIIB metals contained on a nonmetallic refractory material, the nonmetallic refractory material of said supported component comprising less than about one-fourth of the total nonmetallic refractory material of said catalyst, said catalyst additionally containing a halogen constituent.

3,925,197

HYDRODESULFURIZATION PROCESS

Jakob Van Klinken, and Frits M. Dautzenberg, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 4, 1972, Ser. No. 312,246

Claims priority, application United Kingdom, Dec. 7, 1971, 56803/71

Int. Cl. C10g *23/02*

U.S. Cl. 208—216 **8 Claims**

1. A fixed bed process for the catalytic hydrodesulphurization at hydrogen partial pressures of at least 80 and at most 180 bar, at a temperature of 300°–475°C, a space velocity of 0.1–10 pbw of fresh feed per pbv of catalyst per hour and a hydrogen feed ratio of 150–2000 Nl H_2/kg feed of residual hydrocarbon oils having a total vanadium and nickel content of at most 120 ppmw and a C_5-asphaltene content above 0.5%w wherein a catalyst is applied comprising 0.5–20% w nickel and/or cobalt and 2.5–60% w molybdenum and/or tungsten on an alumina or silica-alumina carrier, said catalyst having a specific average pore diameter, p, in nm, in the range of 4.6 to 25.6 inclusive and a specific average particle diameter, d, in mm, in the range of 0.5 to 2.5, inclusive such that the quotient $p/(d)^{0.9}$ meets the requirement

$$3\times10^{-4}\times(P_{H_2})^2 \leq p/(d)^{0.9} \leq 17\times10^{-4}\times(P_{H_2})^2,$$

wherein P_{H_2} is said hydrogen partial pressure in bar; and said catalyst having a pore volume above 0.45 ml/g, with at least 0.4 ml/g of said pore volume in pores having a diameter of at least $0.7\times p$ and at most $1.7\times p$, and a sharp pore diameter distribution characterized by:

a. less than 20% of the pore volume in pores with a diameter smaller than $0.7\times p$,

b. less than 20% of the pore volume in pores with a diameter larger than $1.7\times p$, and

c. less than 10% of the pore volume in pores with a diameter larger than 100 nm.

3,925,198

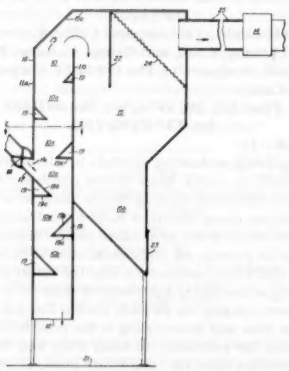
APPARATUS AND METHOD OF AIR CLASSIFYING MUNICIPAL SOLID WASTES

David W. Eckhoff, and Blaine L. Fullmer, both of Salt Lake City, Utah, assignors to University of Utah, Salt Lake City, Utah

Filed Jan. 29, 1975, Ser. No. 545,191

Int. Cl.[2] B07B *7/04*

U.S. Cl. 209—3 **10 Claims**



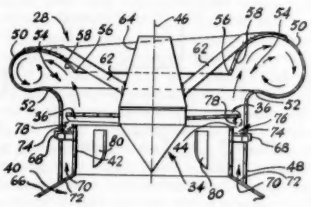
1. Apparatus for classifying, into combustible and non-combustible fractions, collected municipal solid waste materials

that have been shredded, comprising wall means defining a substantially vertical airflow column; means for flowing a classifying stream of air upwardly through the column; air lock means for feeding shredded municipal solid waste materials into the column intermediate the height thereof; opposing sets of baffles projecting inwardly of the column from respective, mutually opposite walls of said wall means, the baffles thereof alternating from wall to wall in substantially vertically spaced arrangement to define a series of individual stages along the height of the column, each stage extending from wall to wall of said mutually opposite walls and between mutually adjacent but opposing baffles, each of the baffles having its lower surface extending substantially perpendicularly of said walls for abruptly intercepting the upward flow of air and entrained waste materials and directing such flow transversely across the column, so there will be localized circulation of air and entrained waste materials across the column within the individual aircirculation stages for effecting repeated impacts of entrained waste materials against baffle and wall surfaces of said stages, each of the baffles having its upper surface substantially flat and sloping downwardly into the column, so heavier waste materials deposited thereon will slide downwardly by gravity, there being at least one of said stages located below the air lock feeding means and formed by baffles that overlap across the column, said column increasing progressively in flow area between each baffle and the opposing wall of the column above said baffles that overlap for progressively decreasing upward flow velocity; means at or near the upper end of the column for the discharge of lighter components of the shredded solid waste materials as a relatively combustible fraction; and means at or near the lower end of the column for the discharge of heavier components of the shredded solid waste materials as a relatively non-combustible fraction.

3,925,199
TRASH REMOVAL APPARATUS FOR SUGAR CANE HARVESTERS

Donald Jonathon Quick, Bundaberg, Australia, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Oct. 16, 1974, Ser. No. 515,287
Claims priority, application United Kingdom, Nov. 20, 1973, 53714/73
Int. Cl.[2] B07B *15/00*
U.S. Cl. 209—3 **14 Claims**

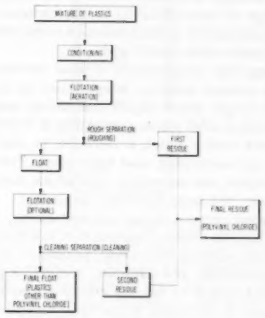


1. A sugar cane harvester including a frame, cane dividing means mounted on the frame for cutting each harvested cane stick into two or more pieces, and trash removal means mounted on the frame for removing trash from the can pieces that have been cut by the cane dividing means, the trash removal means comprising an axial flow extractor fan capable of drawing air through the cane pieces, and means defining an air outlet on the pressure side of the fan for receiving air passing through the fan in the axial direction characterized by means defining an annular trash-receiving opening between the fan and the outlet for receiving trash passing through the fan to pass through said opening under the action of centrifugal forces.

3,925,200
METHOD FOR SEPARATION OF MIXTURE OF PLASTICS

Sumio Izumi, Kokubunji, and Hiroshi Tanaka, Chofu, both of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Nihonba, Japan

Filed Feb. 19, 1974, Ser. No. 443,936
Claims priority, application Japan, May 18, 1973, 48-54551
Int. Cl.[2] B03B *1/00*
U.S. Cl. 209—9 **15 Claims**

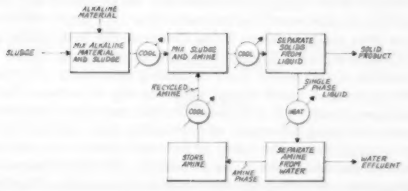


1. A method for the separation of a mixture of particulate plastics comprising (1) at least one of polystyrene, polypropylene, polyethylene and polyamide and (2) polyvinyl chloride into at least one of polystyrene, polypropylene, polyethylene and polyamide, and polyvinyl chloride which comprises conditioning said mixture of plastics in an aqueous liquid medium using at least one conditioning agent selected from the group consisting of an alkali metal or alkaline earth metal salt of lignin sulfonic acid, a hydrophilic organic colloid or a mixture thereof, which conditioning agent renders the polyvinyl chloride more hydrophilic than the at least one of polystyrene, polypropylene, polyethylene and polyamide, and subjecting the resulting mixture to a froth-floatation float at least one of polystyrene, polyethylene, polypropylene and polyamide, in the presence of a frothing agent and simultaneously separating said polyvinyl chloride together with said liquid medium.

3,925,201
METHOD OF DEWATERING MATERIAL CONTAINING SOLID MATTER AND BOUND AND UNBOUND WATER

Robert K. Ames, Seattle, Wash., assignor to Resources Conservation Co., Renton, Wash.

Filed Aug. 3, 1973, Ser. No. 385,489
Int. Cl. B01d *11/02*
U.S. Cl. 210—22 **10 Claims**



1. In the process for dewatering a sludge containing solid matter and water including the steps of:

admixing said sludge with a secondary or tertiary amine to form a mixture, said amine having the formula

wherein:

R_1 is hydrogen or alkyl,

R_2 and R_3 are alkyl radicals having from one to six carbon atoms or alkenyl radicals having from two to six carbon atoms, and

the total number of carbon atoms in the molecule being in the range of from three to seven, inclusive, said amine having an inverse critical solution temperature in a two phase system with water, and

maintaining the temperature of said mixture below the inverse critical solution temperature of said amine to yield a single phase liquid containing said amine and water and a solid phase containing at least a portion of said solid matter which is insoluble in said single phase liquid and separating said solid phase from said single phase liquid, the separated solid phase containing residual amine, the improvement comprising:

prior to admixing said sludge and said amine, admixing with said sludge an alkaline composition selected from lithium hydroxide, sodium hydroxide, potassium hydroxide, calcium hydroxide, and a lithium, sodium or potassium salt of a weak acid in an amount effective to reduce the residual amine in said solid phase after separation from said single phase liquid.

3,925,202

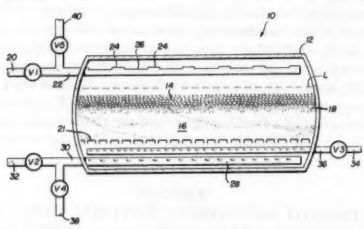
METHOD OF AND APPARATUS FOR FILTERING WATER

Gene Hirs, Birmingham, Mich., assignor to Hydromation Filter Company, Livonia, Mich.

Filed Apr. 25, 1974, Ser. No. 464,289

Int. Cl.[2] B01D *15/06, 23/24*

U.S. Cl. 210—32 **8 Claims**



1. In a filter for reducing the agglomeration of hydrocarbons such as tramp oils with particulate contaminants and filter medium granules, including vertically spaced inlet and outlet conduits, a filter bed interposed between said conduits comprising vertically superimposed, upper and lower granular filter medium layers, and means for backwashing said filter with backwash water and pressurized air, the improvement of said filter medium layers being comprised of hydrophilic materials having a weak to negative affinity for hydrocarbons, the material of said upper layer consisting essentially of particulate granulated black walnut shells having an average size of between about −6 to +12 mesh and the material of said lower layer consisting essentially of particulate sand medium having an average size in the range of between about −16 mesh and +30 mesh, said layers being in contact and being intermixed along the contacting interface and said upper layer having a depth for sufficient intermixing to facilitate the penetration of said lower layer by contaminants, and means flowing water contaminated with suspended particulate matter and immiscible tramp oils through said inlet and into the upper filter medium layer, wherein the water flows through the filter medium for the removal of at least a major portion of the contaminated particulate matter and the immiscible tramp oils.

6. In a method of filtering suspended particulate contaminants and immiscible tramp oils from water, the steps of:

1. flowing water contaminated by said particulate contaminants and tramp oils into and through a filter bed including upper and lower medium layers at a rate sufficient (a) to flow the contaminated liquid downwardly into and through both the upper and lower layers, (b) to enable the removal of contaminants in the lower layer, and (c) to flow the liquid from the lower layer as a clarified filtrate, said lower medium being comprised of granular sand filter media having an average filter medium size in the range of −16 mesh to +30 mesh to reduce mudballing and said upper medium being comprised of granular black walnut shells having an average filter medium size between about −6 and +12 mesh, said layers contacting and being intermixed in the region of the contacting interface, and said upper medium layer having a depth sufficient for adequate intermixing for improved penetration by contaminants into said lower layer;
2. during the performance of Step (1), penetrating said lower medium layer by at least a portion of the particulate contaminants and tramp oils in the flow of water and removing at least a portion of said contaminants from the flow of contaminated water by said lower filter medium layer;
3. terminating the flow of contaminated liquid after said filter medium has removed at least a portion of the contaminants from the filtration flow;
4. regenerating said filter bed by introducing (a) pressurized gas to scour the bed and (b) backwash fluid for expanding the bed and removing accumulated contaminants; and
5. terminating the introduction of pressurized gas and backwash liquid.

3,925,203

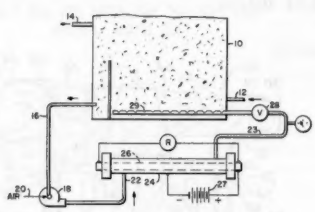
SYSTEM FOR INTRODUCING FLOCCULATING IONS AND AIR INTO WASTE WATER TREATMENT SYSTEMS

Abner B. Turner, R.D. 3, Box 364, Greensburg, Pa. 15601

Filed Feb. 25, 1974, Ser. No. 445,502

Int. Cl. B01d *21/01*

U.S. Cl. 210—44 **2 Claims**



1. A process for removing particulate suspended matter from a liquid in a flotation cell comprising the steps of:

utilizing a pump to withdraw liquid from said cell and introducing air into the pump to form a liquid-air mixture;

supplying the pressurized mixture of air and liquid to an energized electrode positioned in a housing located exteriorly of a flotation cell;

supplementing the supply of air in said mixture with bubbles electrolytically generated by said electrode;

allowing the mixture to remain in contact with the electrode for a time sufficient to permit the air to be dissolved in said liquid and for the electrode to impart metal ions to the liquid;

discharging the mixture from said housing through an expansion valve to reduce the pressure thereof and then

delivering the reduced pressurized mixture to said flotation cell wherein the air comes out of solution in the form of small bubbles;

utilizing the electric charges on said ions to cause colloidal particulate matter to form a loosely assembled concentrated mass of solids; and

utilizing the buoyant characteristics of the air bubbles to combine with the solids to carry the solids to the surface in the form of floc.

3,925,204

LIQUID SEPARATING EQUIPMENT

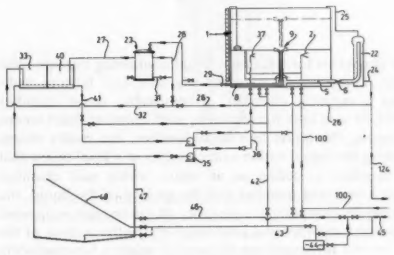
Philippe Jean-Marie Cheysson, Sainte Adresse; Paul Jean Verney, and Michel Alain Coquard, both of Le Havre, all of France, assignors to Exxon Research & Engineering Company, Linden, N.J.

Filed Mar. 29, 1973, Ser. No. 346,056

Claims priority, application France, Mar. 30, 1972, 72.11324

Int. Cl.[2] B01D *17/02*

U.S. Cl. 210—73 **17 Claims**



1. A method of at least partially separating substantially immiscible liquids of different densities from a mixture of liquids as a body of liquid contained within a tank whose surface level is at least at a minimum level about the bottom of said tank and below a maximum level which is substantially at the top of said tank, comprising the steps of: passing the mixture of liquids into the body of liquid in said tank adjacent to the side of said tank in a substantially tangential direction relative to said body of liquid for promoting circular motion of the liquid in said tank and at a speed which substantially avoids the generation of turbulence in said body of liquid within said tank; continuously removing from the surface of said body of liquid a first liquid fraction of relatively low density at a location below the surface of said liquid by means of a skimming weir which floats within a variable predetermined distance below said surface level of said liquid during operation thereof, said distance being selected such that substantially pure low density liquid is removed; passing the removed first liquid fraction to a first fraction receiving zone; separating said first fraction which is received in said first fraction receiving zone into a low density third fraction and a high density fourth fraction; passing said fourth fraction into the body of liquid in said tank substantially tangentially and in the same circumferential direction as said mixture of liquids is passed into said tank, said mixture and said fourth fraction being introduced at a location below said minimum level to substantially avoid direct flow to the skimming weir; continuously removing from the bottom region of said body of liquid a second liquid fraction of relatively high density at least when the concentration of low density liquid in the bottom region is no more than a selected maximum concentration; and passing the removed second liquid fraction to a discharge conduit.

3,925,205

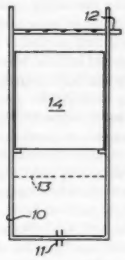
METHOD OF SEPARATING SOLIDS SUSPENDED IN A LIQUID

Vaughan Reynell Sparham, 42 Church St., Great Budworth, Northwich, Cheshire, England

Filed July 2, 1969, Ser. No. 838,613

Int. Cl.[2] B01D *21/00*

U.S. Cl. 210—73 **14 Claims**



1. An apparatus for reducing the solids content of a liquid phase such as sewage works effluent containing colloidal or gelatinous solids suspended therein, said apparatus comprising in combination, a sedimentation tank having an inlet and an outlet, wall means defining a separate chamber within the upper portion of said tank, a sheet perforate member mounted in a substantially horizontal position within said tank in vertically spaced relation to the bottom wall thereof and defining the bottom wall of said chamber, said outlet being located within said chamber whereby liquid flowing from said inlet to said outlet must pass upwardly through said sheet perforate member, and means defining a labyrinth mounted within said separate chamber between said sheet perforate member and said outlet whereby a liquid flowing from said sheet perforate member to said outlet must flow through said labyrinth, said means defining said labyrinth including a plurality of members mounted within said chamber and cooperating to define a plurality of fluid passages through which the liquid flows, said members having a plurality of rugosities thereon extending generally across the direction of flow for forming eddy currents in liquid flowing through said passages to thereby promote cavity sedimentation and adsorption of the solids from the liquid.

3,925,206

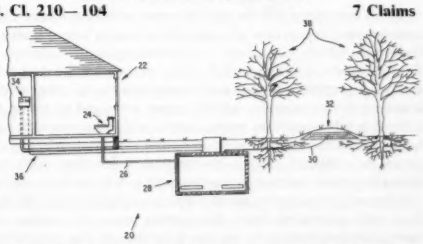
SYSTEM FOR HOME WASTEWATER TREATMENT AND DISPOSAL

Stanley J. Dea, 7 Dogwood Lane, Glen Head, N.Y. 11545

Filed Sept. 26, 1974, Ser. No. 509,572

Int. Cl.[2] B01D *21/24*; **C02C** *5/04*

U.S. Cl. 210—104 **7 Claims**



1. A system for the aerobic batch treatment of wastewater and for the disposal of said treated wastewater in an aboveground disposal field, said system being suited for use in a locale where the existing soil displays unsuitable percolation capabilities, said system comprising:

a unitary treatment tank assembly for receiving and treating said wastewater, said tank assembly having inlet means

for receiving said wastewater from and outlet means including means for transporting said treated wastewater from said tank to said disposal field, said treatment tank assembly further including means for aerating said wastewater to aerobically treat said wastewater while said wastewater is in said tank, said tank assembly further including means for pumping said aerobically treated wastewater through said outlet means out of said tank to said disposal field;

means for sequentially operating said aerating means for a first preselected period of time and said pumping means for a second preselected period of time to provide batch treatment and disposal of said wastewater; and

an above-ground disposal field constructed at the surface of ground displaying unsuitable percolation capabilities, said disposal field including a multilayer bed of porous fill material and a network of perforated distribution piping positioned in a first layer of said bed of porous fill, said first layer of fill being disposed above a second layer of porous fill, said first layer having particles of a larger size than particles of said second layer, said first and second layers forming said bed; said above ground disposal field receiving periodically said aerobically treated wastewater from said tank assembly and dispersing and disposing of said wastewater by evaporation and evapotranspiration whereby said wastewater disposal may be completed independently of said soil upon which said disposal field is constructed.

3,925,207

SEMI-AUTOMATIC CHROMATOGRAPHIC SEPARATION APPARATUS

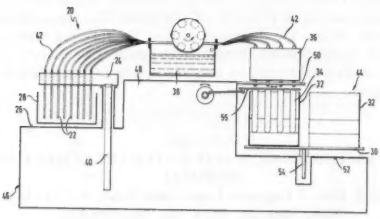
Peter C. Scriba, Munich, Germany, assignor to Sartorius-Membranfilter GmbH, Gottingen, Germany

Filed Apr. 2, 1975, Ser. No. 564,465

Claims priority, application Germany, Apr. 17, 1974, 2418509

Int. Cl.[2] B01D *15/08*

U.S. Cl. 210—138 **12 Claims**



1. An apparatus for the simultaneous semi-automatic chromatographic separation of *n* sample solutions into a least two fractions, which comprises *n* chromatographic columns, *n* flexible tubes each connected at one end to one inlet of the *n* chromatographic columns and connected at the other end to a hollow suction needle, a roller pump arranged to act on the *n* flexible tubes and thus pump sample solutions into which the suction needles may be dipped to the chromatographic columns, a collector device comprising *n* fraction collection flasks for each fraction, a carrier arm in which the *n* suction needles are mounted in parallel spaced relationship with their free ends extending from the carrier arm, the carrier arm being displaceable both in the direction of the length-wise axes of the needles as well as at right angles thereto into predetermined positions relative to a carrier surface for sample solution flasks, a carrier plate situated beneath the outlets of the chromatographic columns and onto which collector devices for carrying fraction collection flasks may be placed in predetermined positions, the carrier plate being rotatable in a plane which is at right angles to the length wise axes of the chromatographic columns, and a time control arrangement having adjustable time elements to co-ordinate and control displacement of the carrier arm, the carrier plate and pumping of the roller pump.

3,925,208

AEROBIC SEWAGE TREATMENT SYSTEM

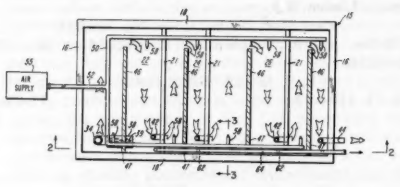
Kenneth J. Yost, Eaton, Ohio, assignor to Coate Burial Vault, Inc., West Milton, Ohio

Filed Mar. 13, 1973, Ser. No. 340,833

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] C02C *5/04*

U.S. Cl. 210—199 **4 Claims**



1. In apparatus for treating a liquid containing organic solid material, comprising a tank having side and bottom walls defining a treating chamber, a removable cover member mounted on said tank for enclosing said chamber, inlet means for directing the liquid into said chamber, and outlet means for limiting the liquid within said chamber at a level below said cover member to define an air space within said chamber between said cover member and the surface of the liquid, the improvement comprising a plurality of air nozzles supported by said cover member and positioned above the surface of the liquid, means for supplying air to said nozzles for producing corresponding streams of air from said nozzles against the surface of the liquid to cause surface diffusion of the air into the liquid and aerobic digestion of the organic solid material within the liquid, each of said nozzles being positioned on an incline relative to said cover member and the surface of the liquid, means for producing slow and continuous horizontal circulation of the liquid within said chamber in a generally circular path and including an arrangement of said nozzles spaced along said path and inclined in the same direction relative to the circulation of the liquid along said path to effect said circulation in response to the air streams contacting the surface of the liquid, and means defining a passage for exhausting the air from said chamber.

3,925,209

STRAINER VALVES

Robert C. Bradley, Paramus, N.J., and Garland L. Fulton, Wayne, Pa., assignors to Multi-Metal Wire Cloth Inc., Tappan, N.Y.

Filed Aug. 28, 1974, Ser. No. 501,290

Int. Cl.[2] B01D *29/38*

U.S. Cl. 210—304 **11 Claims**

1. Strainer apparatus comprising

a housing having opposite fluid inlet and outlet connections at its ends and side fluid inlet and outlet connections,

one of said fluid inlet connections being for process fluid to be strained and one of said fluid inlet connections being for a strainer cleaning fluid,

one of said fluid outlet connections being for strained process fluid and the other of said fluid outlet connections being for discharge of strainer cleaning fluid,

a piston slidably mounted in said housing,

means for controlling the positioning of said piston in said housing comprising

fluid pressure connections to the ends of said housing,

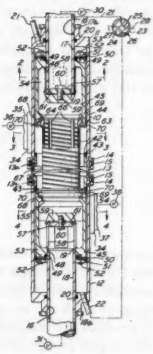
said piston comprising a pair of piston heads with transverse portions against which the fluid pressure at said fluid pressure connections is effective,

said piston heads having

a hollow strainer member interposed therebetween and movable therewith, and

fluid flow control members therein for respectively controlling one of said fluid inlet connections and one of said fluid outlet connections,

said piston having portions in one position connecting the process fluid inlet connection through said strainer in one



direction with the strained process fluid outlet connection and in another position connecting the cleaning fluid inlet connection through said strainer in the opposite direction with the cleaning fluid outlet connection,

said housing being composed of like end sections one with both said fluid inlet connections and the other with both said fluid outlet connections,

said housing having an intermediate section interposed between said housing end sections and to which said housing end sections are detachably connected,

said intermediate section having sealing portions limiting movement of said piston within said housing.

3,925,210

FILTERING DEVICE

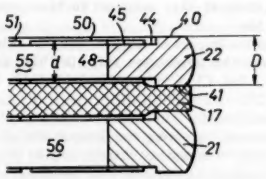
Kurt Strauven, Bonn, Germany, assignor to Wasser-Sand-Forschungs-U. Vertriebs G.m.b.H., Bonn, Germany

Filed Feb. 7, 1974, Ser. No. 440,551

Claims priority, application Switzerland, Feb. 20, 1973, 2402/73

Int. Cl.² B01D *35/02*

U.S. Cl. 210—335 **8 Claims**



1. A filter package for assembly in a holder of an influx container for treatment of potable water, comprising a series of spaced apart filters of varying grades fixedly positioned along a series flow path, each of said filters having a perimeter intercalated by annular sealing and spacing ring means in form of rings each having a region of increased thickness about its outer periphery, each of said rings including plural channel means defined by recessed opposed front surfaces in a region adjacent said region of increased thickness, said plural channel means serving to conduct water flowing radially in said filters out of said filters away from said filters and back to the storage volume to be recycled therethrough along the series flow path.

3,925,211

POLYIMIDE MEMBRANE AND PROCESS FOR MAKING SAME

Wilhelm Schumann, and Heinrich Strathmann, both of Tubingen, Germany, assignors to Forschungsinstitut Bergof GmbH, Tubingen, Germany

Filed Apr. 8, 1974, Ser. No. 458,483

Claims priority, application Germany, Apr. 12, 1973, 2318346

Int. Cl.² B01D *31/00*

U.S. Cl. 210—500 M **7 Claims**

1. A process for making asymmetric semipermeable, polyimide membranes of the type useful in ultrafiltration and desolination process comprising the steps of

a. casting a film of a solution of a reactive prepolymer

b. precipitating an asymmetric membrane structure of said prepolymer by contacting said prepolymer with a precipitating bath; and

c. increasing the chemical and thermal stability of said asymmetric membrane by subjecting said prepolymer membrane to a thermal or chemical ring-closure step.

3,925,212

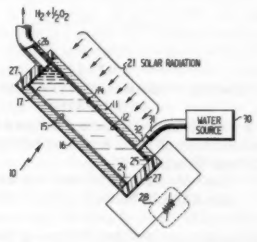
DEVICE FOR SOLAR ENERGY CONVERSION BY PHOTO-ELECTROLYTIC DECOMPOSITION OF WATER

Dimiter I. Tchernev, 3905 Sierra Drive, Austin, Tex. 78731

Filed Jan. 2, 1974, Ser. No. 430,085

Int. Cl.² B01K *1/00*

U.S. Cl. 250—527 **16 Claims**



1. A device producing a photoenergized decomposition of water comprising a container with at least one transparent member permitting the transmission of electromagnetic radiant energy into the container, at least two spaced semiconductor electrodes of different composition each comprising means absorbing at least part of said radiant energy thereby causing the emission of minority carriers therefrom, said semiconductor electrodes arranged in said container so that both said electrodes absorb at least part of said energy, said container adapted to contain an aqueous electrolytic solution in direct contact with both said electrodes, the composition of said electrolytic solution and of said electrodes being such that electrode dissolution does not take place during operation of the device, said minority carrier having a potential energy difference between said electrodes which is at least sufficient to cause decomposition of such electrolytic solution into

hydrogen and oxygen gases, and an external circuit provided between said electrodes.

3,925,213

SULFUR AND PHOSPHORUS BEARING LUBRICANT

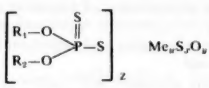
Rasmus Froeschmann, Irschenhausen, and Friedrich Sprügel, Munich, both of Germany, assignors to Optimol-Oelwerke GmbH, Munich, Germany

Division of Ser. No. 227,234, Feb. 17, 1972, Pat. No. 3,840,463. This application Sept. 30, 1974, Ser. No. 510,220
Claims priority, application Germany, Feb. 24, 1971, 2108780
Int. Cl.² C10M *3/18, 5/14, 7/20, 7/24*
U.S. Cl. 252—18 **11 Claims**

1. In a lubricant composition including a base oil of mineral or synthetic origin and a lubrication-improving additive containing chemically bound phosphorus and sulfur while free from chemically bound heavy metal, the improvement which comprises:

a. a metalorganic dithiophosphate in an amount sufficient to enhance the lubrication-improving effect of said additive,

b. said dithiophosphate having the formula



wherein R_1 and R_2 are members of the group consisting of straight-chained alkyl, branched alkyl, and cycloalkyl having 2 to 10 carbon atoms, phenyl, o-alkylphenyl, or p-alkylphenyl, the alkyl of said alkylphenyl having 1 to 6 carbon atoms;

Me is a metal of the group consisting of zinc, lead, tin, tungsten, molybdenum, niobium, lanthanum, antimony, bismuth, chromium, vanadium, or cadmium;

w is 1 or 2;

x is zero or an integer not greater than 6;

y is zero or an integer not greater than 4;

z is 2 or 3.

3,925,214

HOT FORMING LUBRICANT COMPOSITION, SYSTEM AND METHOD

Howard J. Livingston, Jericho, and Bernard Etienne Esquenet, Whitestone, both of N.Y., assignors to Chemclean Corporation, College Point, N.Y.

Filed May 28, 1974, Ser. No. 473,343
Int. Cl.² C01M *3/18, 5/14, 7/20, 7/24*
U.S. Cl. 252—21 **23 Claims**

1. A lubricant composition for use in the hot forming of metals and comprising an organic film forming compound having exfoliated vermiculite particles suspended therein, said exfoliated vermiculite particles having a substantially laminar construction and comprising a plurality of platelet members spaced from one another defining interplatelet spaces, and a portion of said organic film forming compound being absorbed by said particles and disposed in said interplatelet spaces said organic film forming compound being selected from the group consisting of water soluble, water emulsifiable, and non-aqueous compounds.

6. A lubricant composition for use in the hot forming of metals in accordance with claim **1**, wherein

said organic film forming compound is water soluble and selected from the group consisting of lignin sulfonates, sodium gluconates, sodium heptagluconates, cerelose, polyethylene glycols, polyvinyl chloride alcohol, the water soluble salts of rosin-maleic and the water soluble salts of styrene-maleic.

3,925,215

ANTIOXIDANT MIXTURE COMPRISING A MIXTURE OF PHENOTHIAZINE ORALKYL SUBSTITUTED PHENOTHIAZINE AND AN OXIDIZED DIARYLAMINE AND LUBRICATING OILS CONTAINING SAID ANTIOXIDANT MIXTURE

Graham James Jervis, Abingdon, and Robert Robson, Wantage, both of England, assignors to Exxon Research & Engineering Company, Linden, N.J.

Filed May 2, 1974, Ser. No. 466,240
Claims priority, application United Kingdom, May 11, 1973, 22618/73
Int. Cl.² C10M *1/38, 3/32*; **C09K** *15/26*
U.S. Cl. 252—47.5 **6 Claims**

1. An antioxidant comprising a mixture of:

A. at least one thiodiarylamine from the group consisting of phenothiazine and 3,7-dialkyl phenothiazines having alkyl groups of from 1 to 10 carbon atoms, and

B. at least one oxidized diarylamine, the diarylamine being selected from the group consisting of those having the formula:

(1) $A^1—NH—A^2$

or

(2)

wherein A^1–A^4 represent an alkyl substituted phenyl or naphthyl group, wherein the alkyl groups have from 1 to 12

the oxidized diarylamine having been obtained by contacting the diarylamine with air or oxygen at from 150° to 250°C. until a product is obtained having from 0.5 to 2.5 gram atoms of oxygen per gram atom of nitrogen,

the weight ratio of (A) to (B) being between 20:1 and 1:2.

4. A lubricating oil composition comprising a major proportion by weight of a lubricating oil and an antioxidant amount by weight of the antioxidant claimed in claim **1.**

3,925,216

LUBRICATING COMPOSITION FOR CONDUITS AND RACEWAYS

Thomas R. Moorhouse, Anoka, Minn., assignor to American Polywater Corporation, Anoka, Minn.

Filed Sept. 13, 1974, Ser. No. 505,637
Int. Cl.² C10M *1/06, 3/04, 5/04, 7/08*
U.S. Cl. 252—49.3 **5 Claims**

1. A liquid lubricant for lubricating the engagement of articles which are to be pulled through an elongated conduit, the lubricant being a solution by weight ranging from .5 to 5% of poly(ethylene oxide) that has a weight average molecular weight ranging from 100,000 to 5,000,000, about 5 by volume to about 50% by volume of alcohol selected from the group consisting of methanol, ethanol and isopropanol with the remainder being water.

3,925,217

LUBRICANTS FOR ROLLING CONTACT BEARINGS

Richard L. Green, St. Louis, and James C. Wygant, Creve Coeur, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

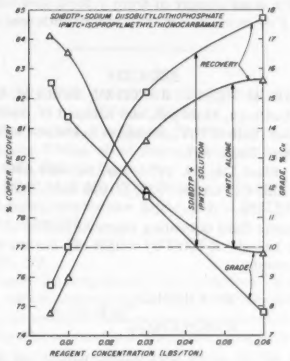
Continuation-in-part of Ser. No. 455,764, March 28, 1974, abandoned. This application July 10, 1974, Ser. No. 487,357
Int. Cl.² C10M *1/20, 3/14, 5/12, 7/16*
U.S. Cl. 252—52 A **7 Claims**

1. A method for improving the elastohydrodynamic film thickness and increasing the fatigue life of rolling contact bearings which comprises introducing to the rolling contact surfaces a fluid comprising one or more cyclohexyl compounds having two or more cyclohexyl rings, said rings being fused, concatenated or linked by one or more C_1 to C_{16} alkylene, carboxy, or ether linkages, each of said compounds having from 10 to 70 carbon atoms.

3,925,218
CONCENTRATION OF ORE BY FLOTATION WITH SOLUTIONS OF AQUEOUS DITHIOPHOSPHATES AND THIONOCARBAMATE AS COLLECTOR

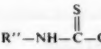
Donald Edwin Zipperian; James Allen Jones, and Thomas Brian Buza, all of Tucson, Ariz., assignors to American Cyanamid Company, Stamford, Conn.

Filed Aug. 1, 1974, Ser. No. 493,946
Int. Cl.² B03D *3/00*; C09K *3/00*; C22B *1/00*
U.S. Cl. 252—61 **8 Claims**



1. An aqueous solution comprising from about 35 to 50 weight percent of an alkali metal salt of a dialkyl dithiophosphate of the formula

wherein M is an alkali metal or ammonium ion and R and R′ are individually selected from alkyl groups of 2 to 8 carbon atoms and correspondingly, from about 65 to 50 weight percent of water, said solution containing dissolved therein an N-alkyl, O-alkyl thionocarbamate of the structure



wherein R″ and R‴ are individually selected from alkyl groups of about 1 to 6 carbon atoms, said thionocarbamate being present in an amount sufficient to provide a weight ratio in the range of from about 30:70 to 95:5 of said dialkyldithiophosphate solution to said thionocarbamate, respectively.

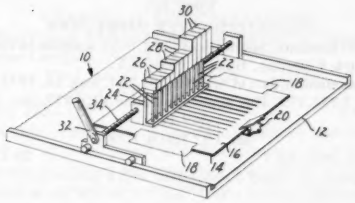
3,925,219
PRESSURE-FIXABLE DEVELOPING POWDER CONTAINING A THERMOPLASTIC RESIN AND WAX

Doyle L. Strong, West Lakeland Township, Washington County, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed June 29, 1973, Ser. No. 375,169
Int. Cl.² G03G *9/00*
U.S. Cl. 252—62.1 P **9 Claims**

1. A flowable, pressure-fixable, dry powder comprising thermoplastic, essentially spherical particles, the binder material of which has a conductivity of at most 10^{-12} mho/cm and which comprises (a) about 50 to 100 parts by weight of a wax component having a melting point between about 45° C. and 150° C., and (b) about 2 to 50 parts by weight of thermo-plastic resin having a softening point above about 60° C.; wherein electrically conductive particles are firmly anchored in said binder material, said electrically conductive particles having a conductivity of at least 10^{-2} mho/cm and an average diameter below about 100 millimicrons forming a radially disposed zone; and wherein said essentially spherical particles exhibit:

a. an electronic conductivity ranging monatonically without decreasing from between about 10^{-11} and 10^{-4} mho/cm in a 100 v./cm. DC electrical field to between about 10^{-8} and 10^{-3} mho/cm in a 10,000 v./cm. DC electrical field,



b. a number average particle diameter below about 20 microns, and

c. a volume ratio of said electrically conductive particles to said total particle volume of between 0.01/100 and 4/100; wherein the dry powder exhibits a transfer density of less than about 0.15 and a paper abrasion density of less than about 0.15.

3,925,220
PROCESS OF COMPRISING SOLVENT EXTRACTION OF A BLENDED OIL

Ivor W. Mills, Media, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Aug. 15, 1972, Ser. No. 280,919
Int. Cl.² H01B *3/00*
U.S. Cl. 252—63 **15 Claims**

1. A composition containing in the range of 0.01 to 2 weight percent of a phenolic oxidation inhibitor and a petroleum oil of improved stability, said petroleum oil having been obtained by a process comprising blending from 40–95 parts by weight of a hydrogenated naphthenic distillate oil having a viscosity-gravity constant in the range of 0.78–0.94, an ultraviolet absorptivity of less than 0.1 in the 330 millimicron region, and less than 0.04 in the 335 millimicron region, with from 60–5 parts of an unhydrogenated and unhydrorefined petroleum oil having a viscosity gravity constant in the range of 0.78–0.899 and then extracting said blend with an aromatic selective solvent to obtain a raffinate product, and wherein said naphthenic distillate is substantially free of naphthenic acids.

2. A composition containing in the range of 0.01 to 2 weight percent of a phenolic oxidation inhibitor and a petroleum oil of improved stability, said petroleum oil having been obtained by a process comprising blending from 25–98 parts by weight of a hydrogenated petroleum oil having a viscosity-gravity constant in the range of 0.78–0.94, an ultraviolet absorptivity of less than 0.1 in the 330 millimicron region and of less than 0.04 in the 335 millimicron region with from 75–2 parts of an unhydrogenated and unhydrorefined petroleum oil having a viscosity-gravity constant in the range of 0.78–0.899 and then extracting said blend with an aromatic selective solvent to obtain a raffinate product, and wherein the blend contains as an additional component from 0.1–30 weight percent of a catalytically cracked cycle oil.

11. A hydrogenated naphthenic oil having a viscosity at 100°F. in the range of 30–40 SUS and containing an effective amount of an oxidation inhibitor, and which is useful as a transformer oil for arctic regions, wherein a component of said oil was obtained by a process comprising hydrorefining a naphthenic distillate having a viscosity greater than 50 SUS at 100°F. to produce a hydrorefined oil having a 335 UVA less than 0.04, 330 UVA Less than 0.1 and a lower boiling range than said distillate, and distilling said hydrorefined oil to pro-

duce, as a fraction, said component having a viscosity at 100°F. in the range of 30–40 SUS.

3,925,221

STABILIZED ESTER IMPREGANT

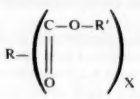
John W. Eustance, South Glens Falls, N.Y., assignor to General Electric Company, Hudson Falls, N.Y.

Continuation-in-part of Ser. No. 281,204, Aug. 16, 1972, Pat. No. 3,754,173. This application June 12, 1973, Ser. No. 369,204

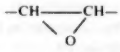
Int. Cl.[2] H01B *3/18*

U.S. Cl. 252—63.7 29 Claims

1. Dielectric liquid composition with a power factor of less than 5% measured at 100°C. and 100 Hz for use in electrical capacitors, and having as a principal constituent an ester of phthalic acid and an alcohol having the formula



where R is an aromatic substituent and R′ is a branched chain alkyl or aryl group, and a stabilizer dissolved in said ester and characterized by containing the group



with an affinity of chemically reacting with acids and acid constituents and precursors, and other impurities in electrical capacitors to limit the power factor thereof to less than about 5.0% measured at 100°C. and 100 Hz the amount of said stabilizer being in the range of from about 0.01 percent to about 10.0 percent by weight.

3,925,222

ELECTRICAL INSULATION OIL

Jiro Ogura; Ikuo Seki; Kiyotaka Sato, all of Hitachi; Masaaki Takahashi; Akira Ito, both of Tokyo, and Yuriko Igarashi, Mitaka, all of Japan, assignors to Kureha Kagaku Kogyo K.K., Tokyo, Japan

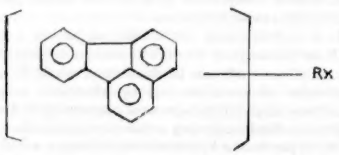
Filed Sept. 30, 1974, Ser. No. 510,224

Claims priority, application Japan, Oct. 4, 1973, 48-111869; Nov. 15, 1973, 48-127669

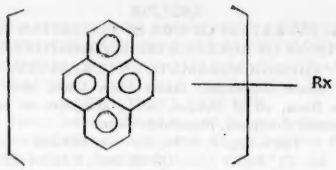
Int. Cl.[2] H01B *3/18*

U.S. Cl. 252—63.7 3 Claims

1. An electric insulating oil comprising a silicone oil and 0.1–10.0% by weight of at least one additive selected from the group consisting of alkyl fluoranthenes of the general formula



and alkyl pyrenes of the general formula



wherein, R denotes an alkyl group having from 1 to 4 carbon atoms and x is an integer of from 1 to 4, and when x is an integer of 2 or more, R may be same or different.

3,925,223

HYDRAULIC FLUIDS BASED ON BORATE ESTERS

Robert L. Coffman, Mahopac, and Richard W. Shiffler, Briarcliff Manor, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

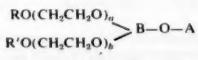
Filed July 19, 1974, Ser. No. 489,890

Int. Cl.[2] C09K *3/00*; C10M *3/20*, *3/48*

U.S. Cl. 252—78 6 Claims

1. Hydraulic fluid consisting essentially of:

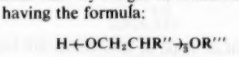
1. about 2 to about 100% by weight of a borate ester having the formula:



wherein each of a and b is an integer having values of 2 to 4, each of R and R′ is an alkyl group having 1 to 4 carbon atoms, and A is an oxyalkylene unit, including mixed oxyalkylene units, having the formula:

wherein n is an integer having values of 2 to 5 and x is an integer having values of 1 to 5;

2. 0 to about 62% by weight of a monoalkoxy trialkylene glycol having the formula:



wherein R‴ is an alkyl group having 1 to 4 carbon atoms and R″ is H or $-CH_3$; and

3. 0 to about 36% by weight of a monoalkyl ether of diethylene glycol wherein the alkyl group contains 1 to about 4 carbon atoms.

3,925,224

DETERGENT ADDITIVE COMPOSITION

Anthony E. B. Winston, Liverpool, N.Y., assignor to Church & Dwight Co., Inc., Syracuse, N.Y.

Continuation-in-part of Ser. No. 352,078, April 17, 1973, abandoned. This application Dec. 13, 1974, Ser. No. 532,527

Int. Cl.[2] C11D *1/00*

U.S. Cl. 252—89 9 Claims

1. A detergent additive composition consisting essentially of (1) from 0.1% to 60% by weight of a water-insoluble surfactant system selected from the group consisting of (a) an essentially water-insoluble component having a lipophilic moiety with from 8 to 24 carbon atoms and at least one polar moiety selected from the group consisting of nonionic, anionic and amphoteric, and (b) an essentially water-insoluble mixture of said component (a) with a water-soluble surfactant selected from the group consisting of anionic surface-active agents, nonionic surface-active agents and amphoteric surface-active agents, where said water-insoluble surfactant system has an HLB value between 2 and 11, (2) from 40% to 99.9% by weight of at least one detergent salt selected from the group consisting of builder salts, detergent fillers and buffer, (3) from 0 to 35% by weight of bleaching agents and their stabilizers and activators, and (4) from 0 to 5% by weight of at least one customary detergent additive selected from the group consisting of enzymes, corrosion inhibitors, anti-redepositing

agents, optical brighteners, foam stabilizers and foam inhibitors.

3,925,225

DOUBLE SOAP BAR

David J. Morrison, 1402 S. 78th St., Omaha, Nebr. 68124

Filed Dec. 26, 1974, Ser. No. 536,337

Int. Cl.² C11D *19/00*

U.S. Cl. 252—90 **3 Claims**

1. A double soap bar comprising:

a first bar formed into a predetermined shape, and a second bar disposed within the first bar.

3,925,226

PROCESS FOR IMPROVING GRANULATED DETERGENTS

Kuniyoshi Takenouchi, Funabashi; Norihiro Ohno, Chofu, and Fusao Kondo, Chiba, all of Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed June 27, 1974, Ser. No. 483,806

Claims priority, application Japan, July 4, 1973, 48-74863; July 4, 1973, 48-74864

Int. Cl.² C11D *17/00*

U.S. Cl. 252—92 **4 Claims**

1. A process for improving the properties of granulated detergents, which comprises adding a lower alcohol or liquid perfume to an ordinary hollow granular detergent produced by the spray drying method when the temperature of the detergent is lower than the boiling point of the alcohol or perfume while making the detergent grains roll over, and subsequently adding thereto a powder of a water insoluble metal soap having a mean particle diameter of less than 100μ when the surface of the grains has been imparted with sufficient adhesive power by the addition of the alcohol or perfume.

3,925,227

NOVEL LAUNDERING COMPOSITIONS

Garland G. Corey, Milltown, and Bernard Weinstein, North Plainfield, both of N.J., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 258,153, May 31, 1972, abandoned. This application Sept. 28, 1973, Ser. No. 401,736

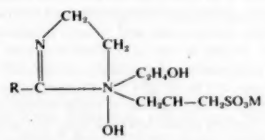
Int. Cl.² C11D *3/48*, *3/29*

U.S. Cl. 252—106 **3 Claims**

1. A liquid detergent formulation which comprises the following components:

	quantity to make to 100%
Triethanolamine linear dodecyl benzene sulfonate	0.1 – 50%
Sodium lauryl ether sulfate wherein the number of ethoxy groups is three	0.1 – 20%
Dimethyl cocoamine oxide	0.1 – 2%

Amphoteric coconut acid derivative having the following formula:



wherein R is a mixture of hydrocarbon radicals ranging from about 10 to about 18 carbon atoms and M is hydrogen or an alkali metal. 0.1 – 4%

Coconut fatty acid diethanolamine condensate	0.1 – 2%
2,4,4′-trichloro-2′-hydroxydiphenyl ether	0.10–1.00%
Ethanol	0.1 – 10%
Water	Sufficient

wherein

2,4,4′-Trichloro-2′-hydroxydiphenyl ether is pre-mixed and solubilized with sodium lauryl ether sulfate and wherein the pH of the system is about 7 to about 8.

3,925,228

CARBONATE BUILT DETERGENTS

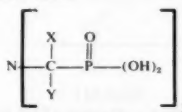
Bao-Ding Cheng, Highland Park, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Jan. 11, 1973, Ser. No. 322,730

Int. Cl.² C11D *3/08*, *3/10*, *9/34*

U.S. Cl. 252—110 **8 Claims**

1. A laundry detergent composition consisting essentially of from 6 to 25% by weight of a detergent system consisting essentially of a mixed non-ionic, synthetic anionic surfactant, soap system wherein the non-ionic is an alkanol-poly (lower alkanoxy), said alkanol having from 10 to 22 carbon atoms and said lower alkanoxy having from 2 to 3 carbon atoms and being formed by the reaction of 1 mole of the alkanol with from 5 to 25 moles of the lower alkylene oxide, the anionic is a linear alkyl benzene sulfonate wherein the alkyl group has from 11 to 13 carbon atoms and the soap is a sodium soap, the ratio of anionic-nonionic-soap, respectively, being 7–3:1:0-.5–2, from about 15 to 50% by weight of a filler selected from alkali metal sulfates and alkali metal silicates, from about 35 to 60% by weight of an alkali metal carbonate and from about 2 to 10% by weight of a builder compound selected from the group consisting of amino tri(lower alkylidene)phosphonic acids having the formula:



wherein X and Y are hydrogen or lower alkyl groups, $CH_3COH(PO_3H_2)_2$, $(H_2O_3PCH_2)_2N\text{-}CH_2CH_2\text{-}N(CH_2PO_3H_2)_2$, $CH_3(CH_2)_{11}N(CH_2PO_3H_2)_2$, $CH_3CH(PO_3H_2)_2$, $CH_2OH(\text{-}PO_3H_2)$, and their water-soluble salts.

3,925,229

CLEANING COMPOSITION CONTAINING PHOSPHORIC ACID, A PROCESS FOR ITS MANUFACTURE AND ITS USES

Friedrich Bolsing, Knapsack Aktiengesellschaft, Knapsack, Germany

Division of Ser. No. 208,395, Dec. 15, 1971, Pat. No. 3,786,091, which is a continuation-in-part of Ser. No. 44,900, June 9, 1970, abandoned. This application Oct. 26, 1973, Ser. No. 409,992

Claims priority, application Germany, June 23, 1969, 19311768

Int. Cl.² C11D *3/06*

U.S. Cl. 252—136 **5 Claims**

1. A phosphoric acid-containing cleaning composition consisting essentially of

a. a paste base containing between 10 and 90 weight percent of water, between 2 and 90 weight percent of at least one amine selected from the group consisting of primary, secondary, and tertiary alkyl and alkylene amines with one or more amine functions, the said amines being derivatives of substituted or unsubstituted hydrocarbon compounds having from 8 to 24 carbon atoms, between 0 and 80 weight percent of an organic solvent immiscible with water or of a mixture of said solvents selected from the group consisting of petroleum, paraffin oil, petroleum ether, benzine, ligroine, mineral oils, fatty oils, chlorinated hydrocarbons, benzene, toluene and xylene, between 0 and 30 weight percent, calculated on the amounts of the water and the said organic solvent(s), of

an emulsifier or a mixture of emulsifiers selected from the group consisting of alkali metal and ammonium salts, amines and esters of fatty acids or sulfonated fatty acids of high molecular weight, fatty alcohol sulfonates, quaternary ammonium compounds, sulfonated amines and phosphoric acid esters, phosphoric acid with a concentration from 5 to 100 weight percent in an amount sufficient to neutralize the said amine or mixture of amines and

b. additives selected from the group consisting of amines other than the said long-chain amines, organic acids, inorganic acids, abrasives, special metal cleaning and polishing agents and corrosion inhibitors.

3,925,230
NON-CAKING LAUNDRY SOUR

Frank Xavier Koepfle, and Herbert Edward Grote, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 26, 1973, Ser. No. 428,512
Int. Cl.[2] C11D *7/10, 7/14;* **D06M** *1/18*
U.S. Cl. 252—136 **2 Claims**

1. A non-caking laundry sour composition consisting essentially of:

a. sodium silicofluoride;

b. sodium bifluoride;

c. anhydrous calcium sulfate; wherein the weight ratio of sodium silicofluoride to sodium bifluoride is 3:1 and wherein the calcium sulfate is present at from 0.3 to 1% by weight of the total fluoride salt content.

3,925,231
WATER DISPERSABLE CHLORINATED SOLVENT AND METHOD

Jack Henry Ritzi, Hamilton, Ohio, assignor to W. R. Grace & Co., New York, N.Y.

Filed Feb. 19, 1975, Ser. No. 551,218
Int. Cl.[2] C11D *7/50*
U.S. Cl. 252—171 **5 Claims**

1. A method for cleaning surfaces which comprises applying a blend of from 0% to about 75% by weight methylene chloride, from about 25% to about 99.9% by weight of a low volatibity chlorinated solvent, and from about 0.1 to about 25% by weight of an emulsifier, said blend being disposed in water in an amount from about 1 to about 25% by weight and applied to the surface at a temperature of 120°F. to 190°F., and thereafter rinsing the applied solution from the surface with water.

3,925,232
HYDROXYAMIDE ACID PRODUCTS AND BUTYROLACTONE AND BUTYROLACTAM PRODUCTS

EL-Ahmadi Ibrahim Heiba, Princeton, and Albert Lloyd Williams, Hopewell Township, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 212,626, Dec. 27, 1971, abandoned. This application Apr. 27, 1973, Ser. No. 355,360
Int. Cl.[2] C11D *7/50*
U.S. Cl. 252—171 **13 Claims**

1. A detergent composition comprising a proportion sufficient to provide detergent properties thereto of a product selected from the group consisting of an alkali metal salt, an amine salt, an amide of a 3-amidocarbonyl-5-hydroxycarboxylic acid and an amine salt and an amide of a 3-metallocarboxy-5-hydroxycarboxylic acid.

3,925,233
FORMALDEHYDE-HEXAMETHYLENE TETRAMINE COMPOSITIONS

Benjamin T. Woodruff, Charleston, W. Va., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Dec. 4, 1972, Ser. No. 311,977
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] C09K *3/00*
U.S. Cl. 252—182 **6 Claims**

1. A stable aqueous solution of up to 80% by weight of hexamethylene tetramine and formaldehyde containing an acidic material selected from mineral acids, organic acids or an acid reacting salt, in which solution the mole ratio of formaldehyde to hexamethylene tetramine is from 3.3:1 to 2:1, the mole ratio of acidic material to hexamethylene tetramine is at least 1:2, the pH of the solution is from 7.4 to 8.4, the density of the solution is about 1.15 to 1.35 grams per ml. and the viscosity is from 20 to 55 cp at 25°C.

2. A method for making a stable aqueous solution of up to about 80% by weight of hexamethylene tetramine and formaldehyde by making a slurry of hexamethylene tetramine in an aqueous solution of up to 60% by weight formaldehyde, the amount of formaldehyde to hexamethylene tetramine varying from 3.3:1 to 2:1, adding to said slurry an acidic material selected from mineral acids, organic acids or an acid reacting salt, the acidic material being added in the amount of one mole of acid to two moles of hexamethylene tetramine, and heating the mixture at a temperature between 60° and 90°C. until it becomes clear.

3,925,234
COATED BLEACH ACTIVATOR

Klaus Hachmann, Hilden; Herbert Saran, Dusseldorf-Holthausen, and Gerhard Sperling, Hilden, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

Filed July 25, 1973, Ser. No. 382,595
Claims priority, application Austria, July 31, 1972, 6594/72
Int. Cl.[2] C01B *15/00;* **C11D** *9/42*
U.S. Cl. 252—186 **8 Claims**

1. A stabilized bleaching assistant suitable for use in pulverulent washing and bleaching compositions comprising drop-shaped to globular-shaped particules at least 70 percent of which have an average diameter within the range of 0.1 mm to 1 mm consisting essentially of 10 percent to 70 percent by weight of at least one activator for active oxygen derived from compounds yielding H_2O_2 in aqueous solutions having an activating action of at least 3 in the Per-Acid Formation Test selected from the group consisting of N-acyl compounds having 2 to 9 carbon atoms in the acyl, O-acyl compounds having 2 to 9 carbon atoms in the acyl, carbonic acid esters and pyrocarbonic acid esters, substantially surrounded by from 30 percent to 90 percent by weight of a mixture of (a) from 2 to 10 parts by weight of said mixture of acids having substantially from 12 to 24 carbon atoms selected from the group consisting of substantially saturated fatty acids, saturated hydroxy-fatty acids, and mixtures thereof, and (b) 1 part by weight of said mixture of alcohols selected from the group consisting of substantially saturated aliphatic monohydric alcohols having from 10 to 20 carbon atoms, their ethoxylated products, their propyloxylated products, and mixtures thereof, where the alkoxylated products are water-insoluble and have from 1 to 5 alkoxy units.

3,925,235
PRODUCTION OF LUMINESCENCE

Vin-Jang Lee, Columbia, Mo., assignor to The Curators of the University of Missouri, Columbia, Mo.

Filed Oct. 30, 1972, Ser. No. 302,359
Int. Cl.² C09K *3/00*
U.S. Cl. 252—188.3 CL **3 Claims**

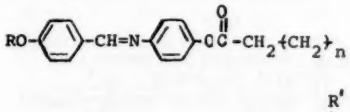
1. A process for continuously producing luminescence comprising carrying out a heterogeneous exothermic charge transfer chemical reaction of at least one reactant in a fluid phase on the surface of a solid state catalyst at temperatures substantially below the temperature of incandescence of the catalyst wherein chemical energy is directly converted into light energy continuously to produce luminescence, and utilizing the luminescence thus produced at a position spaced from the solid state catalytic surface where the luminescence is produced.

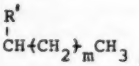
3,925,236
ELECTRO-OPTIC COMPOSITIONS AND DEVICE

Joel Edward Goldmacher, and Michael Thomas McCaffrey, both of Cranbury, N.J., assignors to RCA Corporation, New York, N.Y.

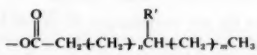
Continuation of Ser. No. 240,819, April 3, 1972, abandoned, which is a continuation-in-part of Ser. No. 829,649, June 2, 1969, abandoned. This application June 22, 1973, Ser. No. 372,649
Int. Cl.² C09K *3/34, 3/00;* **G02B** *5/23;* **G02F** *1/01*
U.S. Cl. 252—299 **10 Claims**

9. A liquid crystal composition consisting essentially of a mixture of one or more compounds having the formula

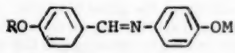




wherein R is a normal alkyl radical of 1–8 carbon atoms, R′ is a normal alkyl radical of 1–6 carbon atoms, *n* and *m* integers of 0–5 with the proviso that the acyloxy group



contains up to 10 carbon atoms and a compound having the formula



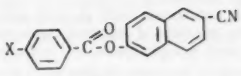
wherein R is a normal alkyl radical of 1–8 carbon atoms and OM is an acyloxy group of 4–10 carbon atoms.

3,925,237
NOVEL LIQUID CRYSTAL ELECTRO-OPTIC DEVICES

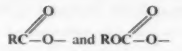
Daniel Louis Ross, Princeton, and Dragan Milan Gavrilovic, Cranbury, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed June 28, 1974, Ser. No. 484,085
Int. Cl.² C09K *3/34;* **C07C** *121/50, 121/60, 121/66, 121/74, 121/75, 121/76;* **G02B** *5/23*
U.S. Cl. 252—299 **8 Claims**

1. In an electro-optic cell comprising a liquid crystal layer between two electrodes, the improvement which comprises including in the liquid crystal layer a compound of the formula



wherein X is a member selected from the group consisting of



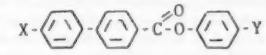
wherein R is an alkyl group having 1–10 carbon atoms.

3,925,238
NOVEL LIQUID CRYSTAL ELECTRO-OPTIC DEVICES

Dragan Milan Gavrilovic, Cranbury, N.J., assignor to RCA Corporation, New York, N.Y.

Filed June 28, 1974, Ser. No. 484,086
Int. Cl.² C09K *3/34;* **C07C** *121/74, 79/46*
U.S. Cl. 252—299 **10 Claims**

1. In an electro-optic cell comprising a liquid crystal layer between two electrodes, the improvement which comprises including in the liquid crystal layer a nematic liquid crystal compound of the formula:



wherein X is a member selected from the group consisting of R-, RO-,

and

groups wherein R is an alkyl group of 1 to 10 carbon atoms and Y is a cyano or a nitro group.

3,925,239
METHOD OF MANUFACTURING A LUMINESCENT ALKALINE EARTH HALOPHOSPHATE

Willem Lambertus Wanmaker, and Dragutin Radielović, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 11, 1972, Ser. No. 288,018
Claims priority, application Netherlands, Sept. 11, 1971, 7112525
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² C09K *11/44*
U.S. Cl. 252—301.4 P **5 Claims**

1. In a method of preparing a trivalent antimony activated luminescent alkaline earth halophosphate having the apatite structure by contacting gaseous antimony trioxide in an inert atmosphere with a base material at a temperature of between 900° and 1,250°C, said base material comprising at least one substance selected from the group consisting of mixtures of reactants capable of producing alkaline earth halophosphate having the apatite structure, non-activated alkaline earth halophosphate having the apatite structure and manganese activated alkaline earth halophosphate having the apatite structure, the improvement which comprises forming the gaseous antimony trioxide in at least one vessel separated from the base material by heating for at least 0.25 hour at a temperature between 900° and 1,250°C at least one substance selected from the group consisting of the alkaline earth antimonites, cadmium antimonite, manganese antimonite, mixtures of at least one of said antimonites with at least one of calcium and strontium pyrophosphate, mixtures of at least one

alkaline earth antimonate with at least one alkaline earth pyrophosphate, mixtures of cadmium antimonate with at least one alkaline earth pyrophosphate and mixtures of manganese antimonate with at least one alkaline earth pyrophosphate, in a molar ratio of antimonate to pyrophosphate of between 4 and 0.5, and contacting the gaseous antimony trioxide obtained with the base material by means of an inert gas stream.

3,925,240

HALOGEN CONTAINING LEAD ACTIVATED CALCIUM SULFIDE LUMINESCENT COMPOSITION

Willi Lehmann, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 876,766, Nov. 14, 1969, abandoned. This application Oct. 18, 1973, Ser. No. 407,728

Claims priority, application Japan, Oct. 26, 1970, 45-93590

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C09k *11/34*

U.S. Cl. 252—301.4 S **4 Claims**

1. A luminescent composition which has an emission substantially confined to the ultraviolet range of 300–400 NM which composition is substantially free from alkali metal, said composition consisting essentially of CaS:Pb, X, wherein Pb is present in an activating proportion of from about 10^{-5} to 10^{-3} gram-atom per mol of sulfide, and X is at least one of the halogens, chlorine, bromine or iodine in a gram-atom amount which is at least equal to and up to about ten times greater than the Pb gram-atom content.

3,925,241

AMPHOTERIC SURFACTANT GELS

Irving R. Schmolka, Grosse Ile, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 580,204, Sept. 19, 1966, Pat. No. 3,740,421. This application Feb. 26, 1973, Ser. No. 320,516The portion of the term of this patent subsequent to June 19, 1990, has been disclaimed.

Int. Cl.² B01J *13/00*

U.S. Cl. 252—316 **7 Claims**

1. A stable gel comprising, based on a total of 100 parts by weight,

a. from about 5 parts to about 50 parts of amphoteric surfactant

b. from about 10 parts to about 80 parts of water

c. from about 15 parts to about 40 parts of a copolymer having the formula: $HO(C_2H_4O)_a(C_3H_6O)_b(C_2H_4O)_aH$ wherein a is an integer such that the hydrophobe portion represented by (C_3H_6O) has a molecular weight of from 2,250 to 4,000 and b is an integer of from 16 to 360.5 such that the hydrophile portion represented by (C_2H_4O) constitutes from about 10 to 90 weight percent of the copolymer with the provisos that:

1. when a is an integer such that the average molecular weight of the hydrophobe is about 2,250, then the total moles of ethylene oxide is from about 52 to 193.2, and the total average molecular weight of the block copolymer is from 4,600 to 10,750;
2. when a is an integer such that the average molecular weight of the hydrophobe is about 2,750, then the total moles of ethylene oxide is from about 48 to 244.2, and the total average molecular weight of the block copolymer is about 4,910 to 13,500;
3. when a is an integer such that the average molecular weight of the hydrophobe is about 3,250, then the total moles of ethylene oxide is from about 36 to 279.6, and the total average molecular weight of the block copolymer is from about 4,910 to 15,500;
4. when a is an integer such that the average molecular weight of the hydrophobe is about 4,000, then the total moles of ethylene oxide is from about 48 to 360.5, and the total average molecular weight of the block copolymer is from 6,150 to 20,000.

3,925,242

PROCESS FOR REDUCING FOAMING OF LIQUIDS SUSCEPTIBLE TO FOAMING

Ferenc Sagi, Bron, and Michel Roussos, Lyon, both of France, assignors to Rhone-Poulenc S.A., Paris, France

Division of Ser. No. 153,829, June 16, 1971, abandoned. This application June 18, 1973, Ser. No. 370,706

Claims priority, application France, June 17, 1970, 70.22284

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² B01D *19/04*

U.S. Cl. 252—321 **3 Claims**

1. A process for reducing the foaming of a liquid susceptible to foaming which comprises incorporating in the liquid, as an anti-foaming agent, an emulsion consisting essentially of water and a silicone phase and 2 to 50 parts by weight sucro-glyceride per 100 parts by weight silicone.

3,925,243

APPARATUS FOR THE MANUFACTURE OF EMULSIONS

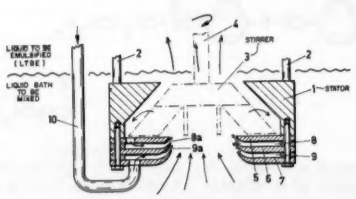
Hans G. Brogli, Gotthelfstrasse 42, Basel, and Werner F. Brogli, Kindergartenstrasse 3, Reinach, Basel-Land, both of Switzerland

Continuation-in-part of Ser. No. 145,853, May 21, 1971, Pat. No. 3,791,984. This application Aug. 23, 1973, Ser. No. 391,158

Claims priority, application Switzerland, June 1, 1970, 8159/70

Int. Cl.² B01F *7/16;* **B01J** *13/00;* **B01F** *5/16*

U.S. Cl. 252—359 C **3 Claims**



2. Apparatus for the manufacture of an emulsion from a first bath liquid and a second feed liquid immiscible with said first liquid, one of said liquids being heated and the other liquid being relatively cool, said apparatus comprising:

a mixing and homogenizing tool immersed in said first liquid comprising an annular stator and a stirring member disposed in said stator, the stator having an inlet side and an outlet side, sand said stirring member being rotatable to form a draw in area for drawing said first liquid from said inlet side into said mixing and homogenizing tool,

and at least one nozzle disposed at said inlet side of said stator and having a nozzle opening of shape and position to introduce said second liquid in fine distribution in the draw in area of said stirring member so that said second liquid is drawn into said mixing and homogenizing tool together with said first liquid and thoroughly mixed therewith in said tool before said liquids are thrust out at said outlet side,

said nozzle having an annular gap which is formed by the inner peripheries of coaxial annular plates which are fixed to said inlet side of said stator, said annular gap being disposed surrounding said draw in area of said stirring member in such manner that said first liquid sucked by the stirring member and flowing past the annular gap produces a low pressure in the nozzle in order to suck in said second liquid through a supply pipe connected to said nozzle.

3,925,244

AUTOMATIC CONTROL DEVICE FOR CAR LIGHTING

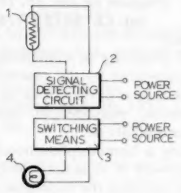
Mashahiro Nagasawa; Hiroyuki Watanabe, both of Hirakata, and Takashi Wakabayashi, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 25, 1974, Ser. No. 464,618

Claims priority, application Japan, Oct. 19, 1973, 48-118205

Int. Cl.² G01J *1/42*

U.S. Cl. 250—372 **3 Claims**



1. An automatic control device for car lighting having a detecting means and circuit means for providing an electric signal in response to a signal from the detecting means for switching a lighting means on or off, characterized in that said detecting means consists of a stannic oxide photoconductive device for selectively detecting ultraviolet light having a wavelength in the range of 3200 to 3600A so that said lighting means is automatically switched on or off according to the amount of ultraviolet light detected by said detecting means.

3,925,245

CORROSION INHIBITING COMPOSITION CONTAINING AN AMINOALKYL-PHOSPHONIC ACID AND AN INORGANIC NITRITE

Arthur Harris, Poynton; John Burrows, Congleton, and James Roger Hargreaves, Sale, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed June 22, 1972, Ser. No. 265,369

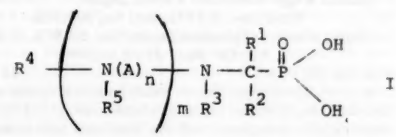
Claims priority, application United Kingdom, June 26, 1971, 30064/71

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C23F *11/10, 11/16*

U.S. Cl. 252—389 A **22 Claims**

1. A synergistic combination consisting essentially of a combination of from 10% to 99% by weight of an alkali metal nitrite and from 90% to 1% by weight of a compound having the formula



wherein

R^1 and R^2 may be the same or different and each represents hydrogen or a hyrocarbyl or hydroxy-substituted hydrocarbyl radical containing up to 8 carbon atoms,

R^3 and R^4 may be the same or different and each represents hydrogen or a hydrocarbyl or hydroxy-substituted hydrocarbyl radical containing up to 8 carbon atoms, a carboxy-alkyl or alkoxy radical containing up to 3 carbon atoms, a phosphonic acid, an alkylene phosphonic acid grouping containing up to 4 carbon atoms or an aralkylene phosphonic acid such that not more than two phosphonic acid groupings separated by less than two carbon atoms may be attached to any nitrogen atoms,

R^5 is hydrogen or an alkylene phosphonic acid containing up to 4 carbon atoms,

A is a saturated divalent hydrocarbyl radical containing up to 6 carbon atoms.

m is 0 or an integer from 1 to 60,

n is 0 or 1; when *m* is 0, R^4 may be a hydroxy grouping or R^3 and R^4 together with the nitrogen atom may form a six membered ring; when *m* is 1, the grouping $R^3N—A—NR^5$ may form a heterocyclic ring, and when m is greater than 1, the constituent R^5 groupings may be the same or different; and the water-soluble salts thereof.

3,925,246

ESTERS AND MIXTURES THEREOF WITH ORGANOTIN COMPOUNDS

Harold Coates, Wombourne; John Desmond Collins, Albrighton, and Iftikhar Hussain Siddiqui, Edgbaston, all of England, assignors to Albright & Wilson Limited, Oldbury near Birmingham, England

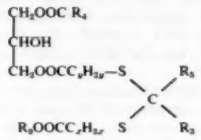
Filed Feb. 15, 1974, Ser. No. 442,874

Claims priority, application United Kingdom, Feb. 19, 1973, 07984/73

Int. Cl.² C09K *15/32, 15/10;* **C08K** *00/00*

U.S. Cl. 252—400 R **10 Claims**

1. A stabilizer composition comprising (1) an ester of the general formula



wherein each of *x* and *y*, which are the same or different, is an integer of 1 – 6, each of R_4 and R_9, which are the same or different, is selected from the group consisting of alkyl groups of 1 to 21 carbon atoms, alkenyl groups of 2 – 21 carbon atoms, cycloalkyl groups, aromatic hydrocarbyl groups, aralkyl hydrocarbyl groups and aralkenyl hydrocarbyl groups, each of R_5 and R_5, which are the same or different, is as defined above for R_4 and R_9, or is hydrogen or R_5 and R_5, together with the carbon atom to which they are attached, forms a cycloalkyl ring, and (2) an organotin compound of the formula

wherein R_1 is selected from the group consisting of alkyl groups of 1 to 12 carbon atoms, cycloalkyl groups, aromatic hydrocarbyl groups or aralkyl hydrocarbyl groups, R_{14} is as defined for R_1 or each of R_{14}, R_{15} and R_{16}, which are the same or different, is selected from the group consisting of groups of formula $—OOCR_4$, $—OOCR_{17}COOR_9$, $—SC_xH_{2x}COOR_9$ and $—SR_4$, or R_{15} and R_{16} together is selected from the group consisting of groups of formula —S—, $—OOCR_{17}COO—$, and $—SC_xH_{2x}COO—$, or R_{15} and R_{16} together represent —S—and R_{14} represents —SH, wherein R_4, R_9 and x are as defined in claim 1 and R_{17} represents a group selected from the group consisting of alkylene, alkenylene, cycloalkylene and arylene groups.

3,925,247
METHOD FOR PREPARING CATALYST FOR THE PRODUCTION OF VINYL FLUORIDE

Eiji Ogura; Nobuki Nomura, both of Onoda, and Kiyotada Emoto, Ube, all of Japan, assignors to Onoda Cement Company, Ltd., Yamaguchi, Japan

Filed Dec. 28, 1973, Ser. No. 429,691
Claims priority, application Japan, Dec. 28, 1972, 47-130229
Int. Cl.² B01J 31/04, 27/12, 27/24, 27/02
U.S. Cl. 252—429 R 10 Claims

1. A method of producing a catalyst for the production of vinyl fluoride by the gaseous reaction of acetylene and hydrogen fluoride, consisting essentially of incorporating activated carbon, which has been activated with nitric acid and washed with water so as to eliminate said nitric acid, with mercuric chloride, mercuric fluoride, mercuric nitrate, mercuric acetate, mercuric oxide, cadmium chloride, cadmium fluoride, cadmium nitrate, cadmium sulphate, cadmium oxide, cadmium hydroxide, or a mixture of mercuric chloride, mercuric fluoride, mercuric nitrate, mercuric acetate or mercuric oxide and a compound consisting of chloride, fluoride, sulphate, nitrate, oxide or hydroxide of lead, tin, cadmium or zinc, and pre-treating the resultant activated carbon with hydrogen fluoride gas.

3,925,248
FILTER MEDIUM FOR GASES

Rolf Moroni, Bornheim-Hersel; Friedrich Karl Rinck, Wachtberg-Niederbachem, and Peter Ehlenz, Vinxel, all of Germany, assignors to Collo Rheincollodium Koln GmbH Werk Hersel, Bornheim-Hersel, Germany

Continuation of Ser. No. 251,080, May 8, 1972, abandoned. This application Aug. 26, 1974, Ser. No. 500,520
Claims priority, application Germany, May 11, 1971, 2123159; Sept. 10, 1971, 2134587
Int. Cl.² B01J 31/06
U.S. Cl. 252—428 7 Claims

1. A filter material for filtering air to remove noxious substances therefrom comprises an intimate mixture of the following particles in a loose bed;

a. a prefoamed plastic material in the form of flakes, said flakes containing open pores and being obtained by comminuting an open pore hydrophilic prefoamed plastic material which has an average pore size of between 0.3 to 4 mm and contains reduction-oxidation catalyst particles incorporated into said prefoamed plastic material during the foaming thereof; and

b. particles of activated carbon in a ratio of about 10–40% by volume with respect to said prefoamed material, at least a predominant proportion of which particles have an average particle size substantially less than the average pore size of said prefoamed plastic material, whereby adhesion of said activated carbon particles to said flakes is attained by binder free mechanical bonding so that separation of said activated carbon particles from said mixture is substantially precluded.

3,925,249
CATALYST FOR PREPARATION OF 6-METHYL-1,5-HEPTADIENE

Peter Fitton, Pequannock, N.J., and Thomas Whitesides, Madison, Wis., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 409,122, Oct. 24, 1973, Pat. No. 3,855,338. This application Aug. 29, 1974, Ser. No. 501,517
Int. Cl.² B01J 21/04, 31/12
U.S. Cl. 252—430 5 Claims

1. A catalyst system comprising at least 0.1% by weight, based on the weight of the catalyst system of a tetra(lower alkyl)tin and at least 40% by weight, based upon the weight of the catalyst system of rhenium oxide on alumina.

3,925,250
PROCESS FOR PREPARING AN IRON CONTAINING CATALYST

Arnold Hausweiler, Zons; Nikolaus Paris, and Karl-Heinz Ennenbach, both of Dormagen, all of Germany, assignors to Erdolchemie Gesellschaft mit beschrankter Haftung, Cologne, Germany

Filed June 8, 1972, Ser. No. 260,945
Claims priority, application Germany, June 11, 1971, 2128903
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² B01J 27/18
U.S. Cl. 252—437 9 Claims

1. Process for preparing an iron-containing catalyst for the synthesis of acrylonitrile by the reaction of propylene with ammonia and molecular oxygen or air on a supported catalyst containing bismuth, molybdenum, iron and phosphorus, which consists essentially of

a. impregnating a bismuth/phosphorus molybdate catalyst on silica gel with an aqueous solution of an iron salt;

b. drying and calcining the impregnated catalyst for 0.3 to 7 hours at 500°C. to 750°C.;

c. the catalysts thus produced consisting essentially of catalytically active metal contents as follows:

6. to 26% by weight bismuth;
2 to 20% by weight molybdenum
0.5 to 10% by weight iron and
0.1 to 1% by weight phosphorus;

and having a specific surface of from 4 to 50 m^2/g.

3,925,251
ANTIMONY PENTAFLUORIDE HYDROCARBON CONVERSION CATALYST

Paul G. Rodewald, Rocky Hill, and Darrell D. Whitehurst, Titusville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 21, 1973, Ser. No. 418,153
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² B01J 27/12
U.S. Cl. 252—441 3 Claims

1. A hydrocarbon conversion catalyst consisting essentially of antimony pentafluoride deposited on silica resulting from pyrolysis of methylated silica.

3,925,252
CATALYZER APPARATUS AND METHOD FOR THE PRODUCTION THEREOF

Tozo Yabuta, Okazaki; Yasuhisa Kaneko, and Akiyoshi Morita, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Nov. 3, 1972, Ser. No. 303,373
Claims priority, application Japan, Nov. 5, 1971, 46-88085
Int. Cl.² B01J 21/18, 35/00
U.S. Cl. 252—447 21 Claims

1. A catalyzer apparatus, in which pellet catalyzers are held between closely seated layers of a heat-resistant net-like material which is wound into a roll like block and both ends of said block are capped by a heat resistant net-like material.

3,925,253
CATALYSTS

Ruth E. Stephens, Royal Oak, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Mar. 19, 1973, Ser. No. 342,787
Int. Cl. B01j 29/06
U.S. Cl. 252—455 R 20 Claims

1. A catalyst support resistant to loss by attrition consisting essentially of a carrier coated with a silica coating, said silica coating containing a rare earth metal oxide and optionally alumina dispersed throughout said coating, the atom ratio of

rare earth metal to silicon to aluminum in said coating being 1:0.1–2.0:0–20.

10. An attrition resistant exhaust gas catalyst consisting essentially of a carrier coated with a silica coating and a catalytic metal oxide, said silica coating containing a rare earth metal oxide, and optionally alumina dispersed throughout said coating, in an amount such that the atom ratio of rare earth metal to silicon to aluminum is 1:0.1–2.0:0–20 and the amount of catalytic metal oxide is such that the atom ratio of catalytic metal to rare earth metal is about 0.6–1.5:1.

3,925,254

DEHYDROCYCLIZATION OF HYDROCARBONS

Masayoshi Oishi, Wilmington, Del., assignor to Sun Ventures, Inc., St. Davids, Pa.

Division of Ser. No. 314,207, Dec. 11, 1972, Pat. No. 3,832,414. This application Sept. 20, 1973, Ser. No. 399,236

Int. Cl.² B01J *29/06*

U.S. Cl. 252—455 Z **4 Claims**

1. A process of preparing a catalyst comprising treating an alkali metal zeolite X or zeolite Y wherein the alkali metal is lithium, sodium or potassium with dilute aqueous solution of an alkali metal salt of a strong acid which is lithium salt, sodium salt or potassium salt and a platinum salt at from 25° to 80°C. to ion exchange from 0.1 to 1.2 weight percent as based on said zeolite of platinum ions for the alkali metal ions of said zeolite, washing the ion exchanged zeolite with water, calcining the zeolite at from 400° to 650°C. in an oxygen containing atmosphere for from about 1 to about 6 hours, reducing the platinum to a free metal state with flowing hydrogen at from 350° to 550°C., applying from 0.1 to 1.2 weight percent dadmium in the form of a cadmium salt and sufficient water to wet the surface of the zeolite to impregnate cadmium on said zeolite, drying said zeolite, calcining the cadmium and platinum containing zeolite at from 400° to 650°C. in an oxygen containing atmosphere for from about 1 to about 6 hours, reducing the platinum and cadmium in the thus calcined zeolite to the free metal state with flowing hydrogen at from 350° to 550°C.

3,925,255

OXIDATION/AMMOXIDATION CATALYST

Tao P. Li, Chesterfield, and Charles W. Hobbs, St. Charles, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 2, 1973, Ser. No. 320,373

Int. Cl.² B01J *29/16, 29/26, 23/64, 23/84*

U.S. Cl. 252—456 **4 Claims**

1. A catalyst system suitable for operation under pressure comprising the elements antimony, uranium, iron and bismuth in an oxidized state represented by the formula:

$Sb_aU_bFe_cBi_dO_e$

wherein *a* is 1 – 10, *b* is 1 – 10, *c* is 0.01 to 1, *d* is 0.001 to 0.1 and *e* is a number taken to satisfy the average valences of the Sb, U, Fe and Bi in their catalytic active oxidation states prepared by forming a mixture of oxides or sulfates of antimony, uranium, bismuth and iron in sulfuric acid, digesting the resulting mixture, adjusting the pH to about 8, filtering the mixture, mixing the filter cake with a catalyst support and evaporating the filter cake mixture to dryness, then heating the dried mixture at a temperature of from about 500°C to about 1150°C to form said active oxidation states.

3,925,256

METHOD OF SOL MANUFACTURE

David A. Rolf, and Vernon B. Chance, Jr., both of Shreveport, La., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed July 15, 1974, Ser. No. 488,383

Int. Cl.² B01J *21/04, 23/26, 23/06, 23/08*

U.S. Cl. 252—463 **4 Claims**

1. A method of preparing a sol which comprises admixing an oxygen containing gas with an acid selected from the group consisting of hydrochloric acid and hydrofluoric acid, and contacting the aerated acid with particles of a metal selected from the group consisting of aluminum, chromium, iron, zirconium, zinc and gallium, in a metals digestion zone while maintaining an excess of the metal reactant therein and maintaining a reaction temperature sufficient to form the sol.

3,925,257

SULFUR RECOVERY CATALYST AND PRODUCTION THEREOF FROM BAUXITE ORE

John P. Horzepa, Edison, and David B. Swanson, Cranford, both of N.J., assignors to Engelhard Minerals & Chemicals Corporation, Edison, N.J.

Filed Mar. 21, 1974, Ser. No. 453,333

Int. Cl.² B01J *23/08*

U.S. Cl. 252—463 **5 Claims**

1. A method for making a catalyst which comprises forming a mixture consisting of a major weight percentage of dry calcined bauxite fines and a minor weight percentage of dry powdered hydrous colloidal boehmite alumina, adding an aqueous solution of an acid capable of peptizing boehmite alumina to the resulting dry mixture of calcined bauxite fines and boehmite alumina with thorough mixing, the acid solution being used in amount sufficient to form a plastic mixture, forming the plastic mixture into particles of desired size and shape, drying and calcining the particles.

3,925,258

METHOD FOR ACTIVATING A CATALYST

Ralph Cox, Pasadena, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 2, 1973, Ser. No. 337,409

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² B01J *23/16*

U.S. Cl. 252—467 **11 Claims**

1. In a method for activating a catalyst comprising controllably passing a heated fluid stream at a preselected rate through a catalyst positioned in a heating zone, discharging the fluid stream from the heating zone and passing said fluid stream to a first location,

the improvement consisting of

a. measuring the pressure of the heated fluid at the heating zone or downstream thereof, and

b. passing at least a portion of said heated fluid discharging from said heating zone to a second location when said measured pressure has reached a first preselected value.

3,925,259

CATALYTIC STRUCTURE FOR THE PURIFICATION OF WASTE GASES AND ITS METHOD OF PREPARATION

Robert Harvey Kane, Ho-Ho-Kus, N.J., assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Nov. 12, 1973, Ser. No. 411,691

Int. Cl.² B01J *23/84*

U.S. Cl. 252—470 **22 Claims**

1. A method of making a shaped catalytic structure comprised of a chromium and copper-containing alloy comprising: a. forming into a structure of desired shape a fine powder comprised of an alloy containing chromium and copper, and b. heating the shaped powder to a temperature above about 2050°F in a non-oxidizing atmosphere for a period of time sufficient to effect a liquid-phase sintering of said fine powder; thereby forming a coherent shaped structure.

3,925,260
CRYSTALLINE FORMS OF 4,4-BIS-TRIAZINYLAMINOSTILBENE DERIVATIVES AND PROCESSES FOR MAKING SAME

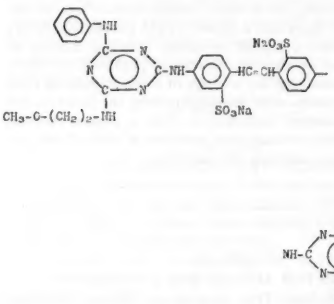
Christopher Johannes Tscharner, Warwick; Maurice Jacob Schwarz, Cranston, both of R.I., and Paul Horlacher, Mohlin, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 195,494, Nov. 3, 1971, abandoned, which is a continuation of Ser. No. 814,562, April 9, 1969, abandoned. This application Aug. 17, 1973, Ser. No. 389,416

Int. Cl.[2] C11D *3/42*; **C07D** *251/68*

U.S. Cl. 252—543 **2 Claims**

1. A composition of matter consisting essentially of an anionic detergent and an amount sufficient to impart optical brightening thereto of the α-crystalline form of a compound having the formula:



characterized by an X-ray diffraction pattern having the following characteristic lines corresponding to: a very strong line at 3.42° and four fairly strong lines at 9.38°, 20.0°, 25.5° and 26.42°.

3,925,261
EXPONENTIAL RESISTANCE MATERIAL AND METHOD OF MANUFACTURING SAME

Inge Lauterbach-Dammler, Nurnberg, Germany, assignor to C. Conradty, Nurnberg, Germany

Filed July 16, 1974, Ser. No. 489,182

Claims priority, application Germany, July 18, 1973, 2336504

Int. Cl.[2] H01B *1/08*

U.S. Cl. 252—519 **10 Claims**

1. A composition adapted for use as an electrical resistance element wherein the electrical resistance varies exponentially with the voltage drop across the element, said voltage drop being given by the equation:

$$E = B \times I^{(1/n)}$$

wherein E is said voltage drop; I is the current through the element, B is a constant equal to the voltage value at which the current is equal to 1 Ampere, and n is a number; said composition comprising about 50–90% ZnO, about 0.1 – 40% ZnF_2, and about 0.1 – 40% MeO; wherein MeO is an oxide selected from the oxides of magnesium, calcium, strontium, barium, iron, cobalt, lead, boron, aluminum, bismuth, manganese, chromium, nickel, antimony, and mixtures thereof.

3,925,262
DETERGENT COMPOSITION HAVING ENHANCED PARTICULATE SOIL REMOVAL PERFORMANCE

Robert Gene Laughlin, and Robert Lee Stewart, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

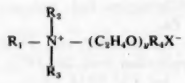
Filed Aug. 1, 1974, Ser. No. 493,952

Int. Cl.[2] C11D *3/066, 1/18*

U.S. Cl. 252—526 **11 Claims**

1. A detergent composition comprising

A. 1 to 99% by weight of the composition of a compound having the formula selected from the group consisting of

i) 

wherein

R_1 is selected from the group consisting of straight and branched chain C_8–C_{30} alkyl and alkenyl moieties and alkaryl moieties in which the alkyl group has 10–24 carbon atoms;

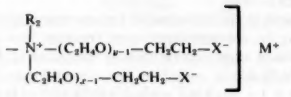
R_2 is selected from the group consisting of straight and branched chain C_8–C_{21} alkyl and alkenyl moieties, alkaryl moieties in which the alkyl group has 6–16 carbon atoms, and C_{1-4} alkyl and hydroxyalkyl moieties;

R_3 is selected from the group consisting of straight and branched chain C_8–C_{21} alkyl and alkenyl moieties, alkaryl moieties in which the alkyl group has 6–16 carbon atoms, C_{1-4} alkyl and hydroxyalkyl moieties and $-(C_2H_4O)_xH$ wherein x has a value of about 3 to about 50;

R_4 is selected from the group consisting of C_1–C_8 alkylene, C_3–C_8 alkenylene, 2-hydroxy propylene, and 2- and 3-hydroxy butylene moieties and C_1–C_4 alkarylene moieties provided that where R_3 is $-(C_2H_4O)_xH$ then R_4 is $-CH_2-CH_2-$;

X^- is an anion selected from the group consisting of sulfate and sulfonate radicals;

and y has a value in the range of 2–100 provided that where R_3 is $-(C_2H_4O)_xH$ then $x+y \geq 10$; and

ii) 

wherein

R_1 is selected from the group consisting of linear and branched C_8–C_{30} alkyl and alkenyl radicals;

R_2 is selected from the group consisting of linear and branched C_8–C_{30} alkyl and alkenyl radicals and C_1–C_4 alkyl and hydroxyalkyl radicals;

X^- is selected from the group consisting of sulfate and sulfonate;

y and x have values in the range of 2–100 provided that $y+x \geq 12$;

M is a cation selected from the group consisting of alkali metal, ammonium and alkanolammonium ions; and

B. 99to 1% by weight of the composition of a detergent builder.

2. A detergent composition according to claim 1 wherein the detergent builder is an inorganic detergent builder selected from the group consisting of alkali metal, ammonium, and alkanolammonium polyphosphates, carbonates, bicarbonates, silicates, aluminosilicates, borates, and sulfates.

3,925,263

PROCESS FOR PREPARING POLYCARBONMONOFLUORIDE

Rokuo Ukaji, Ibaraki; Tutomu Kamihigoshi, Takatsuki; Kenji Mikami, and Shoji Takaki, both of Settsu, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed June 11, 1974, Ser. No. 478,365
Claims priority, application Japan, June 11, 1973, 48-66036
Int. Cl.² C01B 7/19
U.S. Cl. 260—2 H 11 Claims

1. In the process for preparing polycarbonmonofluoride by the reaction of carbon materials with fluorine gas, the improvement which comprises employing as a diluent for the fluorine gas perfluorocarbon compounds having 4 to 8 carbon atoms, said reaction being conducted at a temperature in the range of from 250° to 600°C and under a partial pressure for the fluorine gas of from 0.4 to 0.1.

3,925,264

PROCESS FOR THE PRODUCTION OF ANION EXCHANGERS

Herbert Corte, Oplanden; Harold Heller, Cologne, and Otto Netz, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Continuation of Ser. No. 338,886, March 2, 1973, abandoned. This application Aug. 7, 1974, Ser. No. 495,441
Claims priority, application Germany, Mar. 8, 1972, 2211134
Int. Cl.² C08F 8/02, 8/12, 257/02
U.S. Cl. 260—2.1 E 8 Claims

1. A process for the production of a synthetic, anion-exchange resin, in which at least one crosslinked, insoluble organic polymer containing at least one aromatic nucelus is condensed with at least one N-hydroxyalkyl-imide in the presence of at least one swelling agent and of at least one Freidel-Crafts catalyst, said at least one N-hydroxyalkyl-imide being used in an amount of from 1 to 8 moles per each 2 moles of aromatic nuclei present in said organic polymer and said catalyst being present in an amount of from 2 to 50% by weight, based on the weight of said organic polymer, the water formed during the condensation reaction is continuously removed from the reaction mixture, and the reaction product thus obtained is hydrolysed.

3,925,265

METHYL PHOSPHINE OXIDES AS FLAME RETARDANTS FOR ORGANIC POLYMERS

Kingso Chingtsung Lin, Newark, Ohio, assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 89,103, Nov. 12, 1970, Pat. No. 3,732,316. This application Mar. 8, 1973, Ser. No. 339,456
Int. Cl.² C08G 18/14, 18/38; C08K 5/53
U.S. Cl. 260—2.5 AJ 9 Claims

2. A method of rendering an organic polymer fire retardant comprising incorporating therein an effective fire retardant amount of a composition comprising bis (hydroxymethyl)methylphosphine oxide which has been produced by a process comprising heating tris(hydroxymethyl)phosphine in an inert solvent, at a temperature from about 120° to about 250° centigrade.

3. The method of claim 2 wherein said organic polymer is a polyurethane foam or polyester.

3,925,266

FLEXIBLE POLYETHERURETHANE FOAMS WITH IMPROVED RESILIENCE

Hubert Jakob Fabris, Akron, and Edwin Morgan Maxey, Kent, both of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Filed June 18, 1973, Ser. No. 371,179
Int. Cl.² C08J 9/04
U.S. Cl. 260—2.5 AM 11 Claims

1. A method for the preparation of a highly resilient flexible polyetherurethane foam consisting essentially of (1) mixing a foam formulation consisting essentially of (A) 100 parts by weight of a polyalkyleneether polyol having from 2 to 4 hydroxyl groups per polymer molecule and having an average equivalent wegith per hydroxyl group between about 1,000 and 4,000, said polyol (A) containing no more than 30 mol percent ethylene oxide mers, (B) a low molecular weight chain-extender containing per molecule two isocyanate-reactive functions and being selected from the group consisting of alkanol amines, polyalkylene glycol amines, ortho-diamino-substituted aromatic hydrocarbons and para-diaminosubstituted aromatic hydrocarbons, said compound (B) being present in amounts sufficient to provide from 0.0015 to 0.03 weight equivalents of its more active function per 100 parts of polyol (A), (C) from 1 to 4 parts by weight of water, (D) an aromatic hydrocarbon diisocyanate present in an amount equivalent to an index of 90 to 130, (E) from 0.01 to 1.0 part by weight of a silicon-based surfactant, and (F) 0.1 to 1 part by weight of a tertiary amine catalyst, and (2) allowing the resulting mixture to foam and cure.

3,925,267

POLYMERIC CARRIER FOR A CONTROLLED SYNTHESIS OF PEPTIDES

Jiri Coupek, Prague, and Vladimir Gut, Uhrineves, both of Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Nov. 6, 1973, Ser. No. 413,390
Claims priority, application Czechoslovakia, Nov. 6, 1972, 7475-72
Int. Cl.² C08J 9/00; C08G 12/08, 12/46
U.S. Cl. 260—2.5 R 6 Claims

1. A polymeric gel carrier, for use in the controlled synthesis of polypeptides comprising a terpolymer of a first monomer selected from the group consisting of hydroxyalkyl acrylates, hydroxyalkyl methacrylates, aminoalkyl acrylates, aminoalkyl methacrylates, acrylamides and methacrylamides, a polyfunctional cross-linked monomer of acrylate or methacrylate, and a third monomer which contains an aromatic ring selected from the group consisting of acrylanilide, methacrylanilide, phenyl acrylate, phenyl methacrylate, phenoxyalkyl acrylates, phenoxyalkyl methacrylates, and styrene, said aromatic rings being chloromethylated under the action of formaldehyde and hydrogen chloride.

3,925,268

BETA-AMINO NITRILE CATALYSTS FOR POLYURETHANE PREPARATION

Walter Richard Rosemund, Englewood, N.J.; Michael Ray Sandner, Charleston, and David John Trecker, South Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

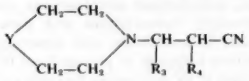
Continuation-in-part of Ser. No. 353,512, April 23, 1973, abandoned. This application June 13, 1973, Ser. No. 369,556
Int. Cl.² C08G 18/18, 18/20, 18/14
U.S. Cl. 260—2.5 AC 51 Claims

1. A method for producing a cellular urethane polymer which comprises reacting an organic polyisocyanate and an organic polyol comprising a polyether polyol having an average of at least two hydroxyl groups per molecule, in the presence of a blowing agent comprising water, an amine catalyst system comprising 3-(N,N-dimethylamino)propionitrile, and at least one organic compound of tin selected from the group

consisting of stannous salts of carboxylic acids, dialkyltin dicarboxylates, dialkyltin oxides, trialkyltin oxides and tin mercaptides.

23. A method for producing a flexible polyurethane foam which comprises reacting and foaming a reaction mixture containing: (a) a tolylene diisocyanate; (b) a polyester polyol having a hydroxyl number of from about 20 to about 100; (c) water; (d) 3-(N,N-dimethylamino)propionitrile; (e) at least one tertiary amine selected from the group consisting of dimethylethanolamine, bis[2-(N,N-dimethylamino)ethyl]ether, 3-dimethylamino-N,N-dimethylpropionamide, triethylenediamine and1,4-dimethylpiperazine; (f) hexadecyldimethylamine; and (g) a foam-stabilizing component.

27. A method for producing a urethane polymer which comprises reacting an organic polyisocyanate and an organic polyol having an average of at least two hydroxyl groups per molecule, in the presence of a catalyst comprising a beta-aminopropionitrile having the formula,



wherein:

Y is an oxygen or nitrogen atom and, when Y is nitrogen, the remaining valence thereof is satisfied by a bond to an alkyl group having from 1 to 4 carbon atoms or to a second $-(CH(R_3)CH(R_4)CN$ group; and

R_3 and R_4 are independently hydrogen or an alkyl group having from 1 to 4 carbon atoms.

3,925,269
PHOTO-DEGRADING RESINOUS COMPOSITION

Hiroshi Miyoshi, Takatsuki; Hirohumi Mori, and Yoriko Tanoue, both of Suita, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Japan

Filed Dec. 28, 1971, Ser. No. 213,211

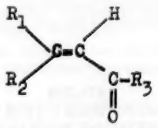
Claims priority, application Japan, Dec. 28, 1970, 45-126944; Dec. 28, 1970, 45-126945

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] C08F *36/02, 36/06, 36/08, 36/14*

U.S. Cl. 260—2.5 B **10 Claims**

1. A photo-degrading resinous composition which consists essentially of from 50 to 100% by weight of a copolymer composed of (i) 95.0–99.9% by weight of a monomer selected from the group consisting of styrene and methyl methacrylate, (ii) 5.0–0.1% by weight of a diene monomer and (iii) 0.5 to 4.9% by weight of an unsaturated ketone having the formula



wherein R_1, R_2 and R_3, which may be the same or different, represent a hydrogen atom or a methyl or phenyl group.

3,925,270
POLYMERIC COMPOSITION COMPRISING SULFONYL CARBAZATES AS BLOWING AGENTS

Byron A. Hunter, Woodbridge, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Filed June 5, 1974, Ser. No. 476,752

Int. Cl.[2] C08J *9/06*

U.S. Cl. 260—2.5 R **19 Claims**

1. A composition comprising a gas-expandable polymeric material and at least one sulfonyl carbazate containing at least one $-SO_2-NHNH-COO-$-group.

3,925,271
PRESSURE SENSITIVE ADHESIVE COMPOSITION

Ivan J. Balinth, Cranford, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Continuation-in-part of Ser. No. 238,945, March 28, 1972, abandoned. This application Aug. 8, 1974, Ser. No. 495,706

Int. Cl.[2] A61L *15/06;* **C08K** *3/36, 5/01;* **C08L** *7/00*

U.S. Cl. 260—3 **10 Claims**

1. A pressure-sensitive adhesive composition consisting essentially of about 14–60% of uncured or reclaimed elastomers selected from the group consisting of natural rubber, styrene-butadiene rubber, nitrile rubber, butyl rubber, chloroprene rubber, isoprene rubber and isobutylene rubber; 21–50% tackifier; 0–15% plasticizer; 0.25–4% stabilizer; 14–19% of particulate silica having a surface area of at least 130 meters ^{2}/gram; and 0–40% of fillers other than silica; all percentages being by weight.

3,925,272
COMPOSITE ELASTOMER COMPOSITIONS

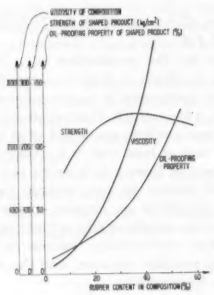
Jyoji Ibata, Saitama; Hidehiko Kobayashi; Kazuo Toyomoto, both of Tokyo; Kazuhiro Suzuoki, and Sumitaka Nogami, both of Saitama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 19, 1973, Ser. No. 342,904

Claims priority, application Japan, Mar. 18, 1972, 47-027938

Int. Cl.[2] C08L *7/00, 9/06;* **C08K** *5/01, 5/12*

U.S. Cl. 260—4 **28 Claims**



1. Composite elastomer compositions which comprise at least four components:

a. 15–45 parts of at least one rubber component selected from the group consisting of polybutadiene, polychlorobutadiene, polyisobutylene, copolymers of isobutylene with isoprene, polyisoprene, copolymers of ethylene and propylene, acrylic rubber, copolymers of a diolefin and acrylonitrile, random or block copolymers of styrene-butadiene, non-vulcanized natural rubbers, polybutadiene terminated with hydroxy or carboxy terminal groups and a mixture of two or more of such substances;

b. 5–60 parts of at least one unsaturated polyester;

c. 5–50 parts of at least one crosslinkable monomer containing ethylenically unsaturated bonds; and

d. 15-60 parts of at least one plasticizer selected from the group consisting of paraffin series process oil, naphthene series process oil, aromatic series process oil, liquid paraffins, n- or iso-butene homopolymers or a copolymer thereof, said polymers or copolymers thereof having a molecular weight of 500 to 5,000, low molecular weight polybutadiene, phthalic acid esters or fatty acid esters, per 100 parts by weight of composition,

which compositions are liquid at normal temperature, have a viscosity of $10 - 10^5$ poises at normal room temperature

and which can be hardened by heat or by means of a radical catalyst.

3,925,273

OIL-IN-WATER TRANSFER PRINTING EMULSIONS AND METHOD

Edmond N. Cuthbertson, Otley, England, and Raymond Davenport, Dover, N.J., assignors to Sandoz, Inc., East Hanover, N.J.

Filed Aug. 5, 1974, Ser. No. 494,551
Int. Cl.² C08L *1/26, 5/04*
U.S. Cl. 260—17 A **11 Claims**

1. A heat transfer printing paste comprising a hydrocarbon mineral oil-in-water emulsion consisting essentially of, per 100 total parts by weight: a) 0.5 to 6 parts by weight of a sublimable disperse dye; b) 1 to 15 parts by weight of an anionic sulfonate dispersing agent, said dispersing agent being present in a weight ratio of at least 0.4 part per part by weight of dye; c) 0.25 to 4 parts by weight of a water soluble film-forming resin selected from the group consisting of a polyvinyl alcohol, a cellulose ether and mixtures thereof; d) 0.05 to 4 parts by weight of a non-ionic emulsifying agent; e) 5 to 25 parts by weight of a hydrocarbon mineral oil which has an International boiling point in the range of 290°F. to 420°F. and which is at least 50% distilled in the boiling range of from 300°F. to 450°F.; f) 45 to 95 parts by weight of water; and g) up to 5 parts by weight of a solid water soluble polysaccharide viscosity modifying agent to provide a final emulsion viscosity in the range of 800 to 5,000 centipoises at 25°C., said paste having a pH of 4.0 to 8.5.

3,925,274

ABRASION RESISTANT CELLULOSIC FABRICS CONTAINING GRAFT POLYMERIZED DIETHYLPHOSPHATOETHYLMETHACRYLATE AND/OR DIETHYLPHOSPHATO-ETHYL ACRYLATE

W. James Brickman, Philadelphia, and Robert W. Faessinger, Media, both of Pa., assignors to Scott Paper Company, Philadelphia, Pa.

Filed Oct. 2, 1974, Ser. No. 511,176
Int. Cl.² C08L *1/02;* **D06M** *13/32, 13/44*
U.S. Cl. 260—17.4 GC **8 Claims**

1. A cellulosic fabric having improved abrasion resistance comprising a cellulosic fabric graft copolymerized with a monomer selected from the group consisting of ethylphosphatoethylmethacrylate and ethylphosphatoethylacrylate.

3,925,275

FLAMEPROOF POLYBUTADIENE RESIN COMPOSITION HAVING EXCELLENT ELECTRICAL PROPERTIES

Akira Musashi; Masami Yamazaki, both of Ichihara, and Makoto Hiruta, Chiba, all of Japan, assignors to Nippon Soda Company, Ltd., Tokyo, Japan

Filed Jan. 22, 1974, Ser. No. 435,419
Claims priority, application Japan, Jan. 25, 1973, 48-10450
Int. Cl.² C08K *3/20, 3/36;* **C08L** *1/02, 9/00*
U.S. Cl. 260—17.4 CL **9 Claims**

1. A peroxide curable flameproof butadiene polymer resin composition comprising:

a. 95% to 5% of 1,2-configuration butadiene polymer;

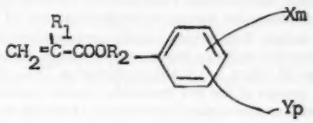
b. 5% to 95% of a halogen containing vinyl compound in such an amount that the halogen content is 3% to 40% of the total composition; and,

c. 0.1% to 10% of an organic peroxide compound, wherein

d. said 1,2-configuration butadiene polymer is a polymer having a molecular weight of 500 to 100,000 having at least one butadiene polymer chain consisting of a butadiene residue and at most 50% of comonomer residue, containing about 60% to about 100% of 1,2-configuration of the total butadiene units or

e. a polymer having molecular weight of 500 to 100,000 containing at least a polymer chain which is obtained by hydrogenizing a butadiene polymer having at least one butadiene polymer chain consisting of a butadiene residue and at most 50% of comonomer residue and containing about 6% to 100% of 1,2-configuration of the total butadiene unit; and further:

f. said halogen containing vinyl compound is a compound having the following formula:



(wherein R_1 is a hydrogen atom or alkyl group having 1, 2 or 3 carbon atoms; R_2 is $(-CH_2CH_2O)_n$; n is 0 or an integer of from 1 to 2, X is chlorine or bromine and X can be the same of different, m is an integer of from 1 to 5, Y is an alkyl group having 1, 2 or 3 carbon atoms, p is 0 or an integer of from 1 to 4 and $m + p$ is 5 or less than 5).

3,925,276

ORGANOPOLYSILOXANE RELEASE RESINS USEFUL IN COOKING AND BAKING PROCESSES

Duane F. Merrill, Ballston Spa, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation-in-part of Ser. No. 115,715, Feb. 16, 1971, abandoned, which is a continuation-in-part of Ser. No. 798,187, Feb. 10, 1969, abandoned, which is a continuation-n-part of Ser. No. 671,574, Sept. 29, 1967, abandoned. This application Sept. 16, 1974, Ser. No. 505,988
Int. Cl.² C08L *91/00*
U.S. Cl. 260—18 S **18 Claims**

1. A silanol-containing organopolysiloxane resin prepared by the process comprising the steps of

i. agitating a mixture comprising (A) an organohalosilane blend consisting essentially of about 60 mole percent methyltrichlorosilane, about 35 mole percent phenyltrichlorosilane, and about 5 mole percent dimethyldichlorosilane, (B) water, (C) acetone, and (D) a water-immiscible organic solvent, wherein there is present by weight in said mixture per part by weight of (A), about 1.7 to about 10 parts of (B), about 0.2 to about 5 parts of (C), and about 0.3 to about 5 parts of (D); and

ii. separating the organic solvent solution of (F) from the resulting hydrolysis mixture of step (i), wherein (F) is a silanol-containing organopolysiloxane resin having an average ratio of about 1.05 organo radicals per silicon atom.

3,925,277

PROCESS FOR PACKAGING AND MIXING A TWO-PART ROOM TEMPERATURE VULCANIZABLE SILICONE RUBBER COMPOSITION

Warren R. Lampe, Ballston Lake, N.Y., assignor to General Electric Company, Waterford, N.Y.

Division of Ser. No. 316,856, Dec. 20, 1972, abandoned, which is a division of Ser. No. 220,532, Jan. 24, 1972, Pat. No. 3,782,379, which is a division of Ser. No. 76,265, Sept. 28, 1970, Pat. No. 3,696,090. This application May 6, 1974, Ser. No. 467,488
Int. Cl.² C08L *91/00*
U.S. Cl. 260—18 S **1 Claim**

1. A process for packaging and mixing the first portion and the second portion of a two-part temperature vulcanizable silicone rubber composition comprising placing said first portion in a first plastic bag and sealing the bag, placing said second portion and said sealed first plastic bag in a second plastic bag and sealing said second plastic bag, kneading said first plastic bag so as to break it and mixing in said second

plastic bag the first portion and the second portion of said room temperature vulcanizable silicone rubber composition, wherein said second portion of said room temperature vulcanizable silicone rubber composition comprises (a) a linear, high molecular weight fluid organopolysiloxane containing terminal silicon-bonded hydroxy groups and having a viscosity of 3×10^6 to 2×10^8 centipoise when measured at 25°C, the organic groups of the aforesaid organopolysiloxane representing monovalent hydrocarbon radicals; (b) 1–100% by weight of said high molecular weight organopolysiloxane of a low molecular weight fluid organopolysiloxane containing terminal silicon bonded hydroxy groups and having a viscosity within the range of 100 to 3.0×10^5 centipoise at 25°C, wherein the organic groups of the low molecular weight organopolysiloxane represent monovalent hydrocarbon radicals such that the blend of the high molecular weight organopolysiloxane and low molecular weight organopolysiloxane has a viscosity in the range of 3×10^6 to 25×10^6 centipoise at 25°C; and (c) a filler, and said first portion of said room temperature vulcanizable silicone rubber composition comprises (d) an alkyl silicate selected from the class consisting of (1) a monomeric organosilicate corresponding to the general formula

wherein R is a radical selected from the class consisting of alkyl, haloalkyl, aryl, haloaryl, aralkyl, alkenyl, cycloalkyl, cycloalkenyl, and cyanoalkyl radicals, and R′ is selected from the class consisting of alkyl, haloalkyl, aryl, haloaryl, alkenyl, cycloalkyl, cycloalkenyl, cyanoalkyl, alkoxy and aryloxy radicals and (2) a liquid partial hydrolysis product of the aforementioned organosilicate monomeric compounds; and (e) a metallic salt of an organic monocarboxylic or dicarboxylic acid in which the metal ion is selected from the class consisting of lead, tin, zirconium, antimony, iron, cadmium, barium, calcium, titanium, bismuth and manganese.

3,925,278

PAINT COMPOSITIONS

Koichi Murai; Yasuo Choshi, and Toshiaki Kobayashi, all of Kyoto, Japan, assignors to New Japan Chemical Company, Limited, Japan

Filed Apr. 11, 1973, Ser. No. 350,040

Claims priority, application Japan, Oct. 4, 1971, 46-77632The portion of the term of this patent subsequent to Oct. 23, 1990, has been disclaimed.

Int. Cl.[2] C08L *67/02;* **C08B** *3/00*

U.S. Cl. 260—22 R **14 Claims**

1. In a method of making a thickened coating composition containing a film forming binder composition selected from the group consisting of tar epoxy, alkyd and modified alkyd resin binder compositions by adding a thickening agent to said binder composition, the improvement which comprises adding to said binder composition from about 0.001% to about 10% by weight of a thickening agent consisting essentially of a condensation product of 1 to 3 moles of a polyhydric alcohol selected from the group consisting of Xylitol, sorbitol and heptitol, and 1 mole of aromatic monoaldehyde selected from the group consisting of benzaldehyde, methyl benzaldehyde, nitrobenzaldehyde, aminobenzaldehyde, naphthylaldehyde, isopropylbenzaldehyde, methylnaphthylaldehyde, nitronaphthylaldehyde, aminonaphthylaldehyde, halogen substituted napthyladehyde, and halogen substituted benzylaldehyde.

3,925,279

COLD SETTING COATING COMPOSITIONS

Hideo Horii, Yokohama; Atsushi Kaiya, Kawasaki, and Yutaka Otsuki, Yokohama, all of Japan, assignors to Nippon Oil Company Ltd., Tokyo, Japan

Filed June 5, 1974, Ser. No. 476,764

Claims priority, application Japan, June 7, 1973, 48-63342

Int. Cl.[2] C09D *3/34, 3/66*

U.S. Cl. 260—22 CB **2 Claims**

1. A cold setting coating composition comprising

a. 100 parts by weight of a maleinized polybutadiene or esterified compound thereof prepared by the addition of 0.5 – 30 weight percent of maleic acid anhydride to a liquid polybutadiene or esterified compound thereof having a number average molecular weight of 500 – **10,000,** more than 50 percent of the butadiene units in the polymer chain being linked in 1, 2-bonds;

b. 5 – 100 parts by weight of a polyfunctional vinyl monomer selected from the group consisting of ethyleneglycol dimethacrylate, ethyleneglycol diacrylate, triethyleneglycol dimethacrylate, and trimethylolpropane trimethacrylate;

c. 5 – 200 parts by weight of a drying oil or semi-drying oil modified alkyd resin;

d. 50 – 500 parts by weight of a pigment;

e. 1 – 10 parts by weight of a ketone peroxide; and

f. 0.01 – 5 parts by weight of a heavy metal salt of organic acid.

3,925,280

FABRICATION MULTIPHASE PLASTICS FROM LIQUID SUSPENSION

Robert D. Lundberg, Somerville, and Henry S. Makowski, Scotch Plains, both of N.J., assignors to Exxon Research & Engineering Company, Linden, N.J.

Division of Ser. No. 229,487, Feb. 25, 1972, Pat. No. 3,846,462. This application Dec. 28, 1973, Ser. No. 429,162

Int. Cl.[2] C08J *3/08, 3/18;* **C08K** *5/05, 5/12*

U.S. Cl. 260—23 R **5 Claims**

1. A composition of matter which comprises a suspension of a thermoplastic composition in finely divided form, i.e., an average particle size of from about 0.1 to about 200 microns, in a nonvolatile liquid medium in such amounts that the solids content of the suspension is in the range of from about 15 to about 75 wt. %; said thermoplastic composition being a thermoplastic ionomer, i.e. a polymer having a backbone composed of a thermoplastic resin and having polar groups pendant to that backbone, said polar groups being sufficiently polar so as to have the capability of forming ionic domains and said nonvolatile liquid medium being capable of solvating and plasticizing the backbone near or above the softening point of that backbone.

3,925,281

VULCANIZABLE ACRYLATE RUBBER COMPOSITIONS

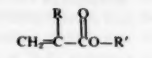
August H. Jorgensen, Rocky River, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed June 5, 1974, Ser. No. 476,587

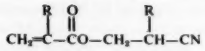
Int. Cl.[2] C08F *8/34, 8/40, 8/42*

U.S. Cl. 260—23 AR **10 Claims**

1. A composition comprising (1) an acrylate rubber consisting essentially of interpolymerized units of (a) from about 50% to about 99.8% by weight of an acrylate monomer of the formula

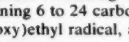


wherein R is hydrogen, or a methyl or ethyl radical and R′ is selected from the group consisting of an alkyl radical containing 1 to about 24 carbon atoms, an alkoxyalkyl radical containing 2 to about 12 carbon atoms in the radical, and an alkylthioalkyl radical containing 2 to about 12 carbon atoms in the radical, (b) from about 0.1% to about 15% by weight of a halogenbearing monomer, (c) from about 0.1% to about 4% by weight of a β-cyanoalkyl acrylate of the formula

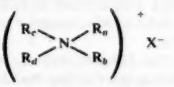


wherein R is defined as above, and (d) up to 49.8% by weight of a copolymerizable monomer containing a terminal vinylidene group selected from the group consisting of vinyl and allyl esters, vinyl ketones, vinyl and allyl ethers, vinyl aromatics, vinyl nitriles, dienes, α-monoolefins, vinyl amides, and divinyls, and (2) a cure system consisting essentially of (a) from about 0.5 part to about 7 parts by weight of an alkali metal salt of an organic acid selected from the group consisting of monocarboxylic acids containing 2 to about 24 carbon atoms, organophosphoric acids of the structure

wherein M is an alkali metal, $y = 1$ or 2, $z = 1$ or 2, and $y + z = 3$, and R is an alkyl radical containing 1 to 24 carbon atoms, an aryl radical containing 6 to 24 carbon atoms, or an alkylphenoxy poly(ethyleneoxy)ethyl radical, and an organosulfonic acid of the structure



wherein y, z, M, and R are defined as above, (b) from about 0.1 to about 10 parts by weight of a quaternary ammonium salt of the structure



wherein R_a, R_b, R_c and R_d are hydrocarbon radicals containing 1 to about 18 carbon atoms selected from the group consisting of alkyl, aryl, alkaryl, and aralkyl radicals, or wherein two or three of the R_a, R_b, R_c and R_d radicals form with the nitrogen atom a heterocyclic structure containing 3 to 8 atoms selected from the group consisting of C, N, O, and S where at least two atoms are C; and X is an anion from an inorganic or organic acid wherein the acidic hydrogen is attached to halogen or oxygen or a monofunctional tertiary amine selected from the group consisting of tertiary aliphatic amines containing 1 to 18 carbon atoms in the aliphatic groups wherein at least one aliphatic group is a methyl or ethyl radical and cyclic methyleneamines and heterocyclic amines containing 4 to 8 carbon atoms in the ring, and (c) up to 15 parts by weight of an acid acceptor, the parts by weight of the cure system ingredients each based upon 100 parts by weight of the acrylate rubber.

3,925,282

PRESSURE SENSITIVE HOT MELT ADHESIVES

Irwin Davis, Somerville; Martin M. Skoultchi, Somerset, and John A. Fries, Piscataway, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed July 24, 1974, Ser. No. 491,270
Int. Cl.² C08L *91/100*
U.S. Cl. 260—23 H **9 Claims**

1. A pressure sensitive, hot melt adhesive composition which possesses the reversible properties of strong cohesive strength at ambient temperatures and desirable melt viscosity at application temperatures, said composition comprising an adhesive polymer formed by the reaction of:

A. a normally tacky random copolymer consisting essentially of:
   1. at least about 50% by weight of at least one monomer chosen from the group consisting of the alkyl esters of acrylic and methacrylic acid wherein the alkyl groups contain 4 to about 12 carbon atoms, and
   2. 0.5 to 15% by weight of a tertiary amine-containing comonomer containing at least 7 carbon atoms; and

B. 0.25 to 40% by weight of the copolymer of at least one organic metallic salt wherein the metal is chosen from the group consisting of the transition metals and tin and lead and the anionic component is an organic acid anion.

3,925,283

POLYURETHANE PRESSURE-SENSITIVE ADHESIVE PRODUCTS AND PROCESSES

Rolf Dahl, West Columbia, S.C., assignor to Continental Tapes, Incorporated, Columbia, S.C.

Division of Ser. No. 50,953, June 29, 1970, Pat. No. 3,761,307. This application Mar. 22, 1972, Ser. No. 236,957
Int. Cl.² C08L *93/00*
U.S. Cl. 260—24 **10 Claims**

1. A pressure-sensitive adhesive comprising the polyurethane-polymer reaction product of: (1) a polyol selected from the class consisting of diols of hydroxyl number from about 56 to 265 and molecular weight from about 400 to 3000 (b) triols of hydroxyl number from about 28 to 56 and molecular weight from about 3000 to 10000 and (c) mixtures of the triols of (b) with 10 to 90% by weight of the diols of (a) and; (2) an aromatic polyamine in amount from about 80 to 100% of the equivalents of excess isocyanate originally present, wherein at least 2 of the amino groups are separated by a distance in the molecule at least equal to that represented by the lengths of the groups selected from the class consisting of (a) 2 to 3 phenylene grups and (b) 2 phenylene groups plus 1 to 2 methylene groups, and wherein said amino groups are all relatively unreactive, being hindered by negative groups in the molecule in a position ortho to said amino groups on the same benzene ring, said negative groups being selected from at least one of the class consisting of chlorine, bromine, ioidne, hydroxyl, ether and aromatic and aliphatic hydrocarbon radicals, with (3) an aromatic polyisocyanate in amounts such that the ratio of the number of equivalents of isocyanate to the number of equivalents of hydroxyl from said polyols is from about 1.1 to 2, in the present of at least one catalyst in amount from about 0.5 to 5% of the weight of said polyols and selected from the class consisting of the stannous salt of an organic carboxyllic acid containing from 1 to 22 atoms of carbon per molecule, dibutyl tin dilaurate, cobalt naphthenate, lead naphthenate, bismuth naphthenate, phenyl mercuric benzoate, phenyl mercuric acetate and the foregoing catalysts mixed with 10 to 100% of their weight of a tertiary amine; and further containing from 0 to 100% of the weight of said polyols, of (A) a tackifying resin selected from the class consisting of the ethylene glycol ester of rosin, the glycerol ester of rosin, the ethylene glycol ester of tall oil, the glycerol ester of tall oil, terpene resins, coumarone-indene resins, unsaturated petroleum hydrocarbon residue resins and heat-reactive and non-heat-reactive phenol-formaldehyde resins (B) a plasticizer in amount from about 0 to 100% of the weight of said polyols and selected from the class consisting of the methyl ester of hydrogenated rosin and chlorinated diphenyl.

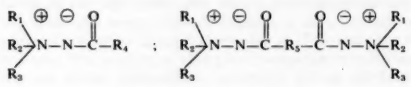
3,925,284

POLYISOCYANATE-BASED FOAM PROCESS USING AMINIMIDES AS CATALYST

Peter S. Carleton, Branford; Robert J. Lockwood, East Haven, and Harold E. Reymore, Jr., Wallingford, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed June 24, 1974, Ser. No. 482,261
Int. Cl.[2] C08G *18/16, 18/20*
U.S. Cl. 260—2.5 AC 7 Claims

1. In a process for the reaction of a polyisocyanate with a polyol in the presence of a catalyst to obtain a polymer containing urethane linkages, the improvement comprising reacting said components at ambient temperature in the presence of a catalytic amount of an aminimide corresponding to a formula selected from:



wherein R_1, R_2 and R_4 are monovalent hydrocarbyl from 1 to 12 carbon atoms, R_1 and R_2 taken together with the N atom to which they are attached additionally represent a heterocyclic radical, R_3 is selected from the class consisting of hydroxyalkyl from 2 to 12 carbon atoms, hydroxyalkoxyalkyl from 3 to 12 carbon atoms and monovalent hydrocarbyl from 1 to 12 carbon atoms, and R_5 is a divalent hydrocarbyl from 1 to 12 carbon atoms.

3,925,285

ANTISTRUCTURE AGENT

Lewis, Richard Newton, Tecumseh, Mich., assignor to SWS Silicones Corporation, Adrian, Mich.

Filed June 20, 1974, Ser. No. 481,006
Int. Cl.[2] C08G *77/04*
U.S. Cl. 260—29.1 SB 2 Claims

1. A heat curable organopolysiloxane composition composed of an organopolysiloxane polymer, an organic peroxide curing agent, a reinforcing filler and a sufficient amount of an antistructure agent to provide an OH content of at least 1 percent of the weight of the filler, said antistructure agent comprising a mixture of hexamethyltrisiloxane-1,5-diol and 1-methoxy-hexamethyltrisiloxane-5-ol, in which the hydroxyl content is between 5 and 11 percent, the methoxy content is between 2 and 4 percent, and the mole ratio of hydroxyl to methoxy is between 2.5 and 7.

3,925,286

SIZING, COATING AND COMBINED SIZING AND COATING COMPOSITION FOR GLASS FIBERS

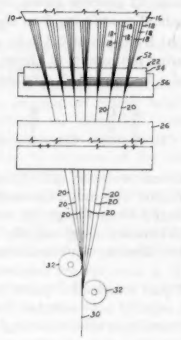
Dennis M. Fahey, Aspinwall, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 292,576, Sept. 27, 1972, which is a division of Ser. No. 93,980, Dec. 1, 1970, Pat. No. 3,718,449. This application Dec. 14, 1973, Ser. No. 425,032
Int. Cl.[2] C08L *61/06*
U.S. Cl. 260—29.3 2 Claims

1. In an aqueous coating composition for coating glass fibers consisting essentially of:

20 to 70 percent by weight of a latex selected from the group consisting of natural rubber latex, neoprene latex, isoprene latex, butyl rubber latex, butadiene-sytrene copolymer latex, acrylonitrite-butadienestyrene copolymer latex, styrene-butadiene-vinylpyridine copolymer latex, and mixtures thereof, and a rubber adhesive comprising a resorcinol formaldehyde resin, with the remainder of said coating composition being water; the improvement comprising; as

said rubber adhesive, a composition consisting essentially of 0.01 to 10 percent by weight of the coating composition of furfuryl alcohol, and 1 to 15 percent by weight of the



coating composition of said resorcinol formaldehyde resin.

3,925,287

ETHYLENE/VINYL CHLORIDE INTERPOLYMERS

Harry M. Andersen, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 328,981, Feb. 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 255,372, May 22, 1972, abandoned. This application Mar. 12, 1974, Ser. No. 450,512
Int. Cl.[2] C08F *210/02*
U.S. Cl. 260—29.6 TA 9 Claims

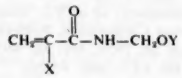
1. An interpolymer latex comprising an interpolymer consisting essentially of:

A. 5 to 70 weight percent ethylene,

B. 30 to 95 weight percent VCl,

C. 2 to 6 weight percent acrylamide or acrylamide in combination with a polar monomer selected from the group consisting of methyacrylamide; N-(alkyl) acrylamide containing 1 to 8 carbon atoms in the alkyl group; N-(alkyl) methacrylamide containing 1 to 8 carbon atoms in the alkyl group; unsaturated carboxylic acids; alkali metal salts and ammonium salts of unsaturated carboxylic acids; acrylylamides and methacrylylamides of aminoalkanoic acids; and alkyl and hydroxy alkyl esters of polycarboxylic acids containing 1 to 4 carbon atoms in the alkyl group and

D. 2 to 6 weight percent of a compound represented by the formula



wherein X represents CH_3 or H and Y represents an alkyl group containing from 1 to 10 carbon atoms, based on the total weight of the interpolymer.

3,925,288

PROCESS FOR PREPARING SALT STABLE LATICES

Stuart Harold Ganslaw, Piscataway, and James L. Walker, Middlesex, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Continuation-in-part of Ser. No. 310,170, Nov. 28, 1972, abandoned. This application Oct. 3, 1974, Ser. No. 511,658

Int. Cl.² C08F *2/16, 18/08*

U.S. Cl. 260—29.6 TA 9 Claims

1. A process for preparing a salt stable latex comprising

a. polymerizing about 5 to 15 parts of a polymerizable monomeric system selected from the group consisting of vinyl acetate and mixtures of vinyl acetate and at least one copolymerizable ethylenically unsaturated comonomer in an aqueous medium containing a free radical polymerization initiator, from 1.0 to 7.0% of a stabilizing electrolyte selected from the group consisting of homopolymerizable ethylenically unsaturated monocarboxylic acids which contain from 3 to 5 carbon atoms, and from 0.1 to 3.0% of a surfactant selected from the group consisting of anionic and nonionic surfactants and mixtures thereof, at a pH of 3.5 to 5.0 and at a temperature of from 40° to 80°C., and

b. adding to the polymerization mixture of step (a) while polymerization is continued the remaining 95 to 85 parts of the monomeric system of step (a) in incremental portions and polymerizing the monomeric system to substantially complete conversion to yield a salt stable latex,

wherein the total amount of monomer added in steps (a) and (b) is equal to 100 parts and wherein the percentages of electrolyte and surfactant are based on the total monomer weight.

3,925,289

WATER-RESISTANT ADHESIVE COMPOSITIONS

Naoyuki Sakato, and Hidetosi Nakamura, both of Saitama, Japan, assignors to Shinetsu Chemical Company, Japan

Filed Apr. 24, 1974, Ser. No. 463,774

Claims priority, application Japan, Apr. 25, 1973, 48-47072

Int. Cl.² C08F *45/24*

U.S. Cl. 260—29.6 B 10 Claims

1. An adhesive composition consisting essentially of

1. an aqueous dispersion of 100 parts by weight of a resin composed of from 10 to 100% by weight of vinyl polymer containing vinyl acetate unit as its main component and from zero to 90% by weight of polyvinyl alcohol;

2. from 2 to 100 parts by weight of a persulfate and

3. from one to 30 parts by weight of a multifunctional compound selected from the group consisting of N-methylol acrylamide, N-methylol methacrylamide, N,N-dimethylol acrylamide, N,N-dimethylol methacrylamide, N,N'-methylene bisacrylamide, ethylene dimethacrylate, diallyl phthalate, triallyl isocyanurate, triallyl phosphate, triallyl trimellitate and tetraallyl oxyethane.

3,925,290

EMULSIONS USEFUL IN THE PREPARATION OF HEAT RESISTANT FIBERS AND FILMS

Kazuto Matsuo, Imari; Michiya Araki; Tomoyuki Matsugu, both of Yatsushiro, and Takahito Mikami, Nishinomiya, all of Japan, assignors to Kohjin Co., Ltd., Tokyo, Japan

Filed Nov. 19, 1973, Ser. No. 416,801

Claims priority, application Japan, Nov. 21, 1972, 47-116207

Int. Cl.² C08L *29/04*

U.S. Cl. 260—29.6 WB 13 Claims

1. An aqueous emulsion containing a polymeric composition comprising (A) polyvinyl alcohol of polymerization degree from 900 to 2500, (B) polyvinyl alcohol derivative of polymerization degree from 100 to 1000 containing 0.5 to 20% by moles of sulfone or sulfate groups and (C) chlorine-containing vinyl polymer, a part of the chlorine-containing vinyl polymer being grafted on to the polyvinyl alcohol derivative, the contents of said polyvinyl alcohol being 40 to 250% by weight of (B) and (C), and the content of said polyvinyl alcohol derivative being 1.5 to 20% by weight of (B) and (C), and the content of said chlorine-containing vinyl polymer being 80 to 98.5% by weight of (B) and (C), the graft efficiency of said composition being from about 5 to 50%.

3,925,291

AQUEOUS ACRYLONITRILE POLYMER SOLUTION CONTAINING THIOCYANATE AND AMIDE COMPOUND

Yasuo Matsumura, and Shoichi Takeuchi, both of Okayama, Japan, assignors to Japan Exlan Company Limited, Osaka, Japan

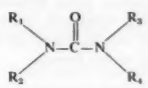
Filed Oct. 24, 1973, Ser. No. 411,324

Claims priority, application Japan, Nov. 1, 1972, 47-109615

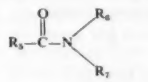
Int. Cl.² C08L *33/20*

U.S. Cl. 260—29.6 AN 9 Claims

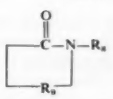
1. An acrylonitrile polymer solution consisting essentially of 5 to 25% by weight, based on the weight of the solution, of an acrylonitrile co-polymer consisting of polymerized units from at least 40% by weight, based on said copolymer, of acrylonitrile, 10 to 50% by weight, based on said copolymer, of vinyl halide, vinylidene halide or mixtures thereof and 0% to 15% by weight, based on said copolymer, of one or more ethylenically unsaturated compounds, and a solvent consisting of 35% to 50% by weight, based on the solvent, of an inorganic thiocyanate and 30 to 50% by weight based on the solvent, of water and 10 to 35% by weight, based on the solvent, of at least one of the organic compounds shown by the following general formulae (I), (II) and (III):



(I)



(II)



(III)

wherein each from R_1 through R_8 is hydrogen or an alkyl group, R_9 is an alklene group, the sum of the carbon atoms of R_1, R_2, R_3 and R_4 and the sum of the carbon atoms of R_5, R_6 and R_7 are each less than 4, and the sum of the carbon atoms of R_8 and R_9 is less than 8.

3,925,292

POLYTETRAFLUOROETHYLENE AQUEOUS DISPERSIONS WHICH PROVIDE COATINGS OF IMPROVED GLOSS

David Alan Holmes, Vienna, W. Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 72,555, Sept. 15, 1970, abandoned. This application Nov. 5, 1973, Ser. No. 412,619

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C08L *27/18*

U.S. Cl. 260—29.6 F 9 Claims

1. The composition consisting essentially of an aqueous dispersion of (a) a non-melt-fabricable polytetrafluoroethylene, (b) a nonelastomeric, melt-fabricable tetrafluoroethylene copolymer and (c) a nonionic surfactant for said polytetrafluoroethylene and said copolymer, said tetrafluoroethylene copolymer being a copolymer of tetrafluoroethylene with sufficient other perfluorinated ethylenically unsaturated copolymerizable monomer to make the copolymer melt-fabrica-

ble said copolymer being present in the amount from 1 to 6 percent based on the weight of said polytetrafluoroethylene, said nonionic surfactant being present in the amount from 3 to 15 percent based on the weight of said polytetrafluoroethylene plus said copolymer, said polytetrafluoroethylene and said copolymer being in the form of particles dispersed in the water of said dispersion.

3,925,293
LOW-TEMPERATURE CURABLE LATICES OF VINYL AND ACRYLIC MONOMERS

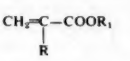
Donald P. Knechtges, Grafton, and Bela K. Mikoflavy, Sheffield Lake, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Continuation of Ser. No. 258,266, May 31, 1972, abandoned, Division of Ser. No. 72,107, Sept. 14, 1970, Pat. No. 3,702,785. This application July 22, 1974, Ser. No. 490,326

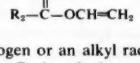
Int. Cl.[2] C08L *35/08, 27/06*

U.S. Cl. 260—29.6 TA **10 Claims**

1. An aqueous polymer latex suitable for impregnating, saturating and coating substrates consisting essentially of about 60% to 91% by weight, based on the total monomers, of (a) an acrylic ester of the formula

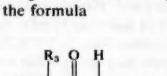


or a vinyl ester of the formula



wherein R is hydrogen or an alkyl radical containing from 1 to 4 carbon atoms, R_1 is a hydrocarbon radical containing from 1 to 12 carbon atoms and R_2 is an alkyl radical containing from 1 to 6 carbon atoms, or a mixture of said monomers; from 5% to 30% by weight of (b) a monomer of the formula

wherein X is chlorine, and Y is hydrogen or chlorine; about 0.5% to 5% by weight of (c) an α,β-olefinically unsaturated carboxylic acid containing from 2 to 12 carbon atoms; from 0.5% to 5% by weight of (d) an N-alkylol amide or N-alkoxyalkyl amide of the formula



wherein R_3 is hydrogen or an alkyl radical containing from 1 to 4 carbon atoms, R_4 is hydrogen or an alkyl group containing from 1 to 8 carbon atoms and n is an integer from 1 to 4; and (e) about 2 to 15% by weight of monomer containing a polymerizable double bond selected from the group consisting of α-olefins, vinyl aromatics, alkylvinyl ethers, α,β-olefinically unsaturated nitriles and acrylamides, said latex maintained at a pH below about 7 and containing from about 5% to 75% by weight total solids.

3,925,294
CONTROLLING VISCOSITY OF CHLOROPRENE-SULFUR COPOLYMERS

Alfred Michael Doyle, Londonderry, Ireland, and William Shear, Louisville, Ky., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 17, 1973, Ser. No. 324,505

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] C08F *2/22, 2/44*

U.S. Cl. 260—29.7 SQ **8 Claims**

1. In a process for polymerizing chloroprene, containing up to 50% by weight of an ethylenically unsaturated monomer copolymerizable therewith, in an aqueous emulsion containing a small amount of dissolved sulfur, to give a latex of rubbery polymer in which the polymer is plasticized by the addition of a tetraalkyl thiuram disulfide and a sodium alkyl dithiocarbamate and isolating the polymer from said latex in a multiplicity of Mooney viscosity grades, the improvement which comprises (1) maintaining the mole ratio of said dithiocarbamate to said thiuram disulfide substantially constant in the preparation of each viscosity grade and (2) varying the total amount of dithiocarbamate plus thiuram disulfide present to give isolated polymers of each desired viscosity grade.

3,925,295
PROCESS FOR THE PREPARATION OF POLYMER DISPERSIONS

Peter George Osborn, Windsor, and Peter Francis Nicks, Maidenhead, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 237,522, March 23, 1972, abandoned. This application Feb. 4, 1974, Ser. No. 439,640

Claims priority, application United Kingdom, Mar. 30, 1971, 8164/71

Int. Cl.[2] C08J *3/00;* **C08K** *5/01;* **C08L** *67/00, 77/00*

U.S. Cl. 260—34.2 **10 Claims**

1. A process for the preparation of a dispersion of finely divided particles of a condensation polymer selected from the group consisting of polyesters and polyamides in a liquid medium in which the polymer is insoluble which comprises heating in the liquid medium at a temperature of at least 150°C. at least one reactant which undergoes a condensation polymerization reaction to form a polyester or polyamide with the elimination of a by-product of low molecular weight, the liquid medium having a boiling point not lower than the reaction temperature, at least one of the reactants being insoluble in said liquid medium and present as a liquid disperse phase in an emulsion in which the emulsifying agent is a polymeric material containing in its molecule at least one chain-like component of a type which is soluble and non-self-associated in the liquid of the disperse phase and at least one chain-like component of another type which is soluble and non-self-associated in the liquid of the continuous phase, the average molecular weight of the individual components being at least 1,000, the total molecular weight of the individual components of each type being at least 3,000 or at least $n \times 1{,}000$, where n is the number of the individual components of the other type, whichever is the higher, and the ratio of the total weights of the individual components of the two types being from 3:1 to 1:3, one of the chain-like components of an emulsifying agent present which is soluble in a disperse phase also being provided with a reactive group selected from the group consisting of glycidyl groups and carboxyl groups which can take part in the condensation polymerization reaction so as to form a component capable of associating with the polymer produced.

3,925,296

FOUNDRY AGGREGATE BINDERS

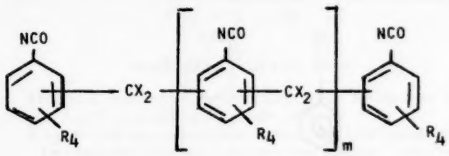
Jonathan A. Stone, Heath, Ohio, and Albert W. Bluemle, North Tonawanda, N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. Nos. 197,503, Nov. 10, 1971, abandoned, and Ser. No. 192,627, Oct. 26, 1971, abandoned, which is a continuation-in-part of Ser. No. 787,262, Dec. 26, 1968, abandoned. This application Jan. 2, 1974, Ser. No. 430,324

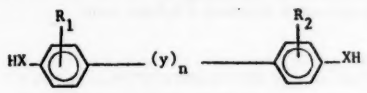
Int. Cl.² C08L 75/04

U.S. Cl. 260—37 N 45 Claims

1. A binder composition for foundry aggregates which comprises a solution of an inert solvent and a room temperature curable composition comprising (1) an organic polyisocyanate of the formula:



wherein R_4 is selected from the group consisting of hydrogen, chlorine, bromine, alkyl having 1 to 5 carbon atoms, and alkoxy having 1 to 5 carbon atoms; X is selected from the group consisting of hydrogen, alkyl having 1 to 10 carbon atoms, and phenyl; and m has an average value of at least about 0.5, and (2) a phenolic compound of the formula:



wherein X is oxygen or sulfur, *y* is an alkylidene radical, an aryl bis alkylene radical, an arylene radical, —S—, —S—S—, or

n is 0 or 1, and R_1 and R_1 are hydrogen, alkyl of 1 to 6 carbon atoms or halogen, and wherein said polyisocyanate is present in a proportion to provide from about 0.9 to 1.1 reactive isocyanate groups per reactive hydrogen present in said curable composition.

3,925,297

FILLED COMPOSITION AND ARTICLE CONTAINING PERFLUORINATED SURFACTANT

Gerhard R. Sprengling, Blairsville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 298,214, Oct. 17, 1972, Pat. No. 3,841,957. This application Apr. 30, 1974, Ser. No. 465,637

Int. Cl.² C08L 63/00

U.S. Cl. 260—37 EP 22 Claims

1. A composition comprising

1. about 15 to about 70% synthetic, organic resin;
2. about 30 to about 85% non-conductive filler; and
3. about 0.001% to about 1.0% of a surfactant having a perfluorinated chain at least 3 carbon atoms long at one end and a polar group at the other end, said surfactant possessing the property of lowering the surface energy of said resin by freely migrating to the surface of said resin and to its interfaces with said filler after said resin is hardened.

3,925,298

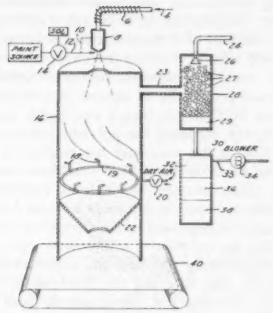
METHOD OF MAKING DRY PIGMENTED POWDER PAINT

Ivan H. Tsou, Pontiac, Mich., assignor to Grow Chemical Corporation, New York, N.Y.

Filed Apr. 25, 1973, Ser. No. 354,375

Int. Cl.² C08J 3/08, 3/12, 3/20

U.S. Cl. 260—39 9 Claims



1. The method of making dry pigmented powder paint, comprising:

making a liquid paint having a pigmented film forming portion, and a solvent portion which is immiscible with water,

finely dividing the liquid paint into minute droplets,

contacting the minute droplets, contacting the minute droplets with steam superheated sufficiently to vaporize the solvent portion and cause the pigmented film forming portion to form dry paint particles, wherein the vapor pressure of solvent and steam totals at least atmospheric pressure,

separating the spent superheated steam-solvent vapor mixture at a sufficient rate to prevent the condensation of either vapor on the powder paint particles,

cooling the dry powder paint sufficiently to prevent agglomeration,

condensing the steam-solvent vapor mixture to form an immiscible liquid mixture of water and the paint solvent, and

separating the solvent for reuse in making the liquid paint.

3,925,299

ANHYDRIDE ACRYLIC COPOLYMERS AS ADDITIVES FOR UNSATURATED POLYESTER MOLDING COMPOSITIONS

Thomas Richard Phillips, Belpre, Ohio, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 17, 1973, Ser. No. 425,073

Int. Cl.² C08L 33/12, 67/06

U.S. Cl. 260—40 R 6 Claims

1. In a composition useful for bulk molding and sheet molding which comprises (a) 20 to 80% by weight of an alpha,beta-ethylenically unsaturated polyester, (b) 20 to 80% by weight of an ethylenically unsaturated monomer and (c) 1 to 25% by weight of a thermoplastic copolymer which is soluble in mixtures of (a) and (b), an improvement which comprises employing as the thermoplastic copolymer, a copolymer containing (1) polymerized methylmethacrylate units, (2) polymerized units selected from the group consisting of ethyl acrylate, n-butylmethacrylate, isobutylmethacrylate, and (3) polymerized units selected from the group consisting of maleic anhydride and itaconic anhydride.

3,925,300

MOLDING COMPOUNDS AND METHOD OF MAKING SAME

Michael G. Roberts, Heath, and Kenneth P. Chase, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 4, 1974, Ser. No. 457,948
Int. Cl.[2] C08K 7/14; C08L 67/06
U.S. Cl. 260—40 R 20 Claims

1. In the process of producing low-shrink thermosetting polyester molding compounds wherein an unsaturated thermosetting polyester prepolymer, an unsaturated solvent therefor, and a minor amount of a thermoplastic polymer that is also miscible in said solvent is mixed therewith, the improvement comprising: initiating polymerization of an unsaturated monomer composed principally of styrene at a temperature between 40°C and 90°C to produce a non-highly branched thermoplastic polymer, stopping the polymerization reaction when less than 50% of the monomer has reacted to give a polystyrene having a narrow band of intermediate molecular weight between approximately 75,000 and approximately 500,000 and having a dispersity between 1.0 and 2.6, maintaining said polystyrene dispersed in the styrene as a solution thereof, and mixing the solution of said polystyrene and styrene with the thermosetting polyester prepolymer to form a hardenable mixture, and whereby the hardenable mixture during cure forms nonspherical thermoplastic bodies of a separated phase having a diffuse interface tightly bonded with the cured thermoset resin.

3,925,301

PROCESS FOR THE CONTINUOUS PRODUCTION OF CARBON BLACK-SYNTHETIC RESIN CONCENTRATES

Claus Richard Engel, Bruhl; Heinz Linke, Grossauheim; Lothar Rothbühr, Hermulheim; Werner Sroka, Bruhl; Jes Vogt, Furtwangen, and Hermann Westlinning, Kleinostheim, all öf Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Filed June 27, 1974, Ser. No. 483,823
Claims priority, application Germany, June 29, 1973, 2333079
Int. Cl.[2] C08K 3/04
U.S. Cl. 260—42 13 Claims

1. In a process for preparing highly concentrated carbon black-thermoplastic synthetic resin concentrates employing a continuous screw kneader in which kneading occurs, the improvement comprising adding the carbon black to the synthetic resin in at least two separate places in series in the conveying direction during the kneading, 10 to 80% by weight of the total carbon black being added in the first place of addition.

3,925,302

EMBOSSED PACKAGING MATERIAL

Jules Magder, and Murray H. Reich, both of Princeton, N.J., assignors to Princeton Chemical Research, Inc., Princeton, N.J.

Filed Nov. 4, 1971, Ser. No. 195,801
Claims priority, application Japan, July 15, 1971, 46-52771
Int. Cl.[2] C08K 3/20, 3/36, 5/09
U.S. Cl. 260—42.46 11 Claims

1. The process which comprises forming packaging material such as a film of container of polybutene which is at least 50% isotactic and contains 5 to 80% by weight of a filler and thereafter embossing said packaging material so as to exceed the yield point in selected areas which then stand out as more opaque against a less opaque or transparent background, which areas retain their distinctness at temperatures in excess of 140°F.

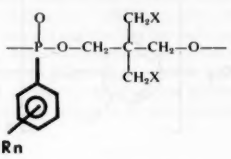
3,925,303

FLAMEPROOFING OF ACRYLONITRILE POLYMERS AND COPOLYMERS

Andre Rio, and Gilbert Vivant, both of Lyon, France, assignors to Rhone-Poulenc S.A., Paris, France

Continuation of Ser. No. 374,098, June 27, 1973, abandoned. This application Aug. 19, 1974, Ser. No. 498,431
Claims priority, application France, June 30, 1972, 72.23796
Int. Cl.[2] C08K 5/53
U.S. Cl. 260—45.7 P 8 Claims

1. In a fire-resistant composition based on polyacrylonitrile or a copolymer of acrylonitrile with 0.5 to 30% by weight of one or more ethylenic comonomers, the improvement wherein the composition comprises 1 to 40% by weight of a glycol polyarylphosphonate, which consists essentially of a plurality of units of the general formula:



in which R represents a hydrogen atom, a halogen atom, an alkyl radical containing 1 to 4 carbon atoms, or a halogen-substituted alkyl radical containing 1 to 4 carbon atoms, *n* is equal to 1, 2 or 3 and X represents a halogen atom.

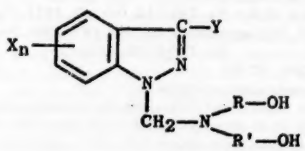
3,925,304

SURFACE-COATING COMPOSITIONS CONTAINING N-(INDAZOLYL-N[1]-METHYL)DIALKANOLAMINES

Pasquale P. Minieri, Woodside, N.Y., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Division of Ser. No. 308,156, Nov. 20, 1972, Pat. No. 3,828,067. This application Feb. 5, 1974, Ser. No. 439,721
Int. Cl.[2] C09D 5/14
U.S. Cl. 260—45.8 N 6 Claims

1. A surface-coating composition that comprises (*a*) a water-insoluble, film-forming resinous binder selected from the group consisting of oleoresinous binders, synthetic linear addition polymers obtained by the vinyl polymerization of monoethylenically-unsaturated monomers, and mixtures thereof and (*b*) about 0.10 percent to 3 percent, based on the weight of said composition, of a biocidal compound having the structural formula



wherein X represents halogen; Y represents hydrogen or halogen; R and R′ each represents an alkylene group having 1 to 8 carbon atoms; and n represents a number in the range of 0 to 3.

3,925,305

THERMALLY-STABLE HIGH NITRILE RESINS AND METHOD FOR PRODUCING THE SAME

Eddie Wardlow, Jr., Cleveland, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Aug. 8, 1973, Ser. No. 386,592

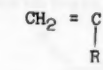
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C08K *5/20;* **C08L** *51/06*

U.S. Cl. 260—45.9 NC **11 Claims**

1. A polymer composition stable toward thermal discoloration containing from about 0.1 to 1.5 parts by weight of acrylamide per hundred parts of resin, wherein said polymer is composed of 100 parts by weight of:

A. at least 50% by weight of at least one nitrile having the structure

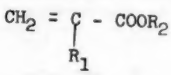


wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms, or a halogen, and

B. up to 50% by weight based on the combined weight of (A) and (B) of at least one member selected from the group consisting of:

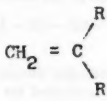
1. styrene,

2. an ester having the structure



wherein R_1 is hydrogen, an alkyl group having from 1 to 4 carbon atoms, or a halogen, and R_2 is an alkyl group having from 1 to 6 carbon atoms,

3. an alpha-olefin having the structure



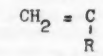
wherein R′ and R″ are alkyl groups having from 1 to 7 carbon atoms,

4. a vinyl ether selected from the group consisting of methyl vinyl ether, ethyl vinyl ether, the propyl vinyl ethers, and the butyl vinyl ethers, and

5. vinyl acetate, and

wherein said monomers are copolymerized in the presence of from 0 to 40 parts by weight of:

C. a rubbery polymer of a conjugated diene monomer selected from the group consisting of butadiene and isoprene and optionally a comonomer selected from the group consisting of styrene and a nitrile monomer having the structure



wherein R has the above designation, said rubbery polymer containing from 50 to 100% by weight of polymerized conjugated diene and from 0 to 50% by weight of comonomer.

3,925,306

PROCESS FOR STABILIZING POLYAMIDES

Karl Schlichting, Bobenheim-Roxheim; Peter Horn; Johannes Schlag, both of Ludwigshafen, and Wolfgang Koernig, Mannheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen(Rhine), Germany

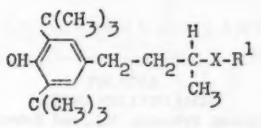
Filed Feb. 21, 1974, Ser. No. 444,414

Claims priority, application Germany, Feb. 24, 1973, 2309435

Int. Cl.² C08K *5/16*

U.S. Cl. 260—45.9 NC **6 Claims**

1. A process for stabilizing polyamides against oxidation and thermal degradation, which comprises incorporating therein 0.01 to 2% by weight, based on said polyamide, of a stabilizing compound of the formula



in which X denotes —NH—, and R^1 denotes a carbonylalkyl or carbonylaryl group in which the alkyl moieties are branched-chain or straight-chain hydrocarbon radicals of from 1 to 20 carbon atoms, and the aryl moieties are phenyl or naphthyl radicals which may be substituted at any position.

3,925,307

ANTIOXIDANTS FOR POLYARYLETHER KETONES

Klaus Joachim Dahl, Palo Alto, and Floyd Masato Kameda, Mt. View, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Apr. 23, 1973, Ser. No. 353,422

Int. Cl.² C08G *67/00*

U.S. Cl. 260—45.75 R **9 Claims**

1. A composition comprising a polyarylether ketone and an effective antioxidant amount of metal oxide selected from the group consisting of the amphoteric metal oxides of aluminum, beryllium, bismuth, cadmium, cerium, gallium, germanium, lanthanum, lead, manganese, tin, titanium, zinc, zirconium, uranium, and mixtures thereof.

3,925,308

HYDRAZINO NICKEL THIO-BIS-PHENOLATES AND POLYOLEFINS STABILIZED THEREBY AGAINST THE EFFECTS OF HEAT AND LIGHT

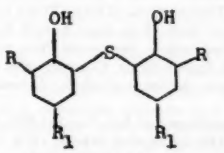
Elmar Harry Jancis, Naugatuck, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Filed Feb. 6, 1974, Ser. No. 439,801

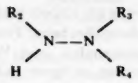
Int. Cl.² C08G *6/00*

U.S. Cl. 260—45.75 N **20 Claims**

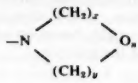
1. A stabilized polyolefin composition having incorporated therein a stabilizing amount of a hydrazino nickel thio-bis-phenolate which is a hydrazine complex of a nickel thio-bis-phenolate, where the thio-bis phenol is of the formula:



where R is selected from the group consisting of hydrogen, normal alkyl or normal alkenyl, and R_1 is selected from the group consisting of normal, secondary, tertiary and cyclic alkyl groups, and the hydrazine is of the formula



where R_2, R_3 and R_4 are independently chosen from the group consisting of hydrogen and primary, secondary and tertiary alkyl groups consisting of 1 to 8 carbon atoms and R_3 and R_4 may be joined together with the nitrogen to form a heterocyclic structure of the formula



where x is 1 to 3, y is 1 to 3 and n is zero or 1.

3,925,309
DIMETHYLTIN ESTERS

Lewis B. Weisfeld, Princeton, N.J., and Robert C. Witman, Cincinnati, Ohio, assignors to Cincinnati Milacron Chemicals Inc., Reading, Ohio

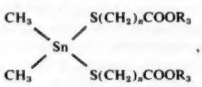
Continuation-in-part of Ser. Nos. 177,516, Sept. 2, 1971, and Ser. No. 317,228, Dec. 21, 1972, Pat. No. 3,810,868, and Ser. No. 435,264, Jan. 21, 1974, Pat. No. 3,887,519. This application Apr. 9, 1974, Ser. No. 459,372

Claims priority, application Germany, June 7, 1973, 2329039The portion of the term of this patent subsequent to June 3, 1992, has been disclaimed.

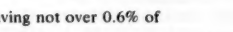
Int. Cl.² C08G *6/00*

U.S. Cl. 260—45.75 S **49 Claims**

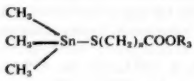
1. A pipe comprising a halogen containing resin selected from the group consisting of chlorinated polyethylene a vinyl halide resin and a vinylidene halide resin with a stabilizingly effective amount of a mixture of (1) 60 to 96% of a compound having the formula



(2) 4 to 40% of a compound having the formula



and having not over 0.6% of



as an impurity in the stabilizer and where R_3 is hydrocarbon of up to 20 carbon atoms and n is an integer of 1 to 3.

3,925,310
HIGH MOLECULAR WEIGHT COPOLYAMIDES CONTAINING HYDANTOIN UNITS

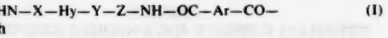
Gerhard Dieter Wolf; Hans Egon Kunzel, both of Dormagen; Günther Blankenstein, Stommeln; Peter Kleinschmidt, Dormagen, and Francis Bentz, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Continuation-in-part of Ser. No. 361,526, May 18, 1973, abandoned. This application May 3, 1974, Ser. No. 466,841

Int. Cl.² C08G *69/32*

U.S. Cl. 260—47 CZ **10 Claims**

1. High molecular weight aromatic copolyamide consisting essentially of less than 15 mol percent of structural units which contain hydantoin rings of the formula

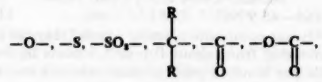


(I)

in which

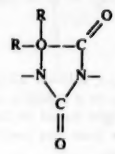
Z is a single bond or —Hy—X—;

X and Y, which may be the same or different, are divalent aromatic groups which consist of one or more condensed rings or several aromatic rings which are linked together by single bonds or by bridge members selected from the group consisting of



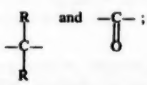
and —NH—SO_2—; or the halogen, C_1 to C_4 alkyl, NO_2 or CN substitution products of said divalent aromatic group;

Hy is a divalent hydantoin ring of the formula

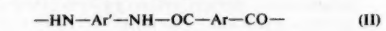


R is hydrogen, C_1-C_4 alkyl, cycloalkyl or phenyl;

Ar is a divalent aromatic group which contains of one or more condensed rings or of several aromatic rings which are linked together by single bonds or by bridge members selected from the group consisting of members—O—,—S—,—SO_2—,



or the halogen, C_1 to C_4 alkyl, NO_2 and CN substitution products of said divalent aromatic group; and more than 85 mol percent of structural units of the formula



(II)

in which

Ar has the meaning indicated above; and

Ar' has the meaning indicated for X; the copolyamides having a relative solution viscosity η_{rel} (measured on a 0.5% solution of the copolyamide in concentrated sulphuric acid at 25°C) of 1.2 – 2.5; the copolyamides containing a mol percent of hydantoin units sufficient to achieve a moisture absorption of at least 9% in a fiber prepared therefrom in which moisture absorption is measured by comparing moist fiber prepared by washing the fiber at 30°C., drying, exposure to an atmosphere of 20°C. and 65% relative humitity for 24 hours; and dry fiber dried in a vacuum at 80°C.

3,925,311
THERMALLY STABLE ARYLOXYBENZIMIDAZOBENZOPHENANTHROLINE COMPOSITIONS

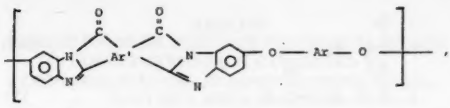
Fred E. Arnold, Centerville, Ohio; John G. Breland, and Frank W. Villaescusa, both of Colorado Springs, Col., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 30, 1974, Ser. No. 474,562

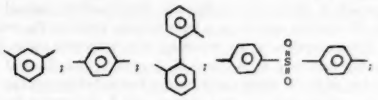
Int. Cl.² C08G *73/20*

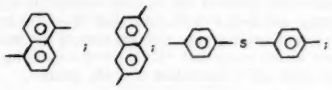
U.S. Cl. 260—47 CP **6 Claims**

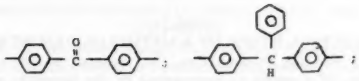
1. A thermally stable polymer consisting essentially of repeating units having the following formula:

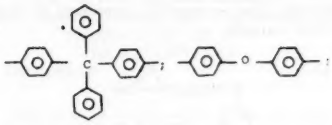


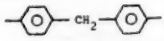
wherein Ar is

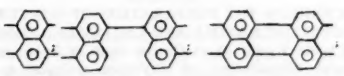


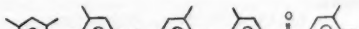


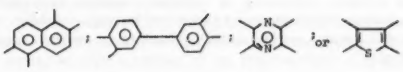




or  and wherein Ar' is





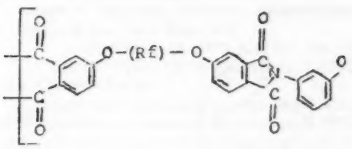


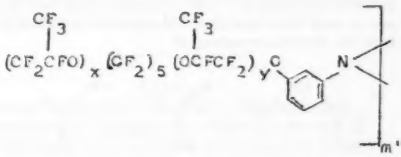
3,925,312
POLYIMIDES OF ETHER-LINKED ARYL TETRACARBOXYLIC DIANHYDRIDES

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and James A. Webster, Dayton, Ohio

Filed July 11, 1974, Ser. No. 487,852
Int. Cl.² C08G 73/10
U.S. Cl. 260—47 CP **5 Claims**

1. A normally-solid polyimide consisting essentially of repeating units having the structure:





wherein Rf is perfluoroalkylene having the structure $-(CF_2)_n-$ or a perfluoroalkylene ether having the structure $-(CF_2)_m\text{-}O\text{-}(CF_2)_m-$ wherein n is an integer of 2 to 10 and m is an integer of 1 to 10; x and y are each 0 to 3 and $x + y = 0$ to 5; and m' is 1 to 100.

3,925,313
POLYIMIDE WATER-SOLUBLE COMPOSITION

Makoto Kojima; Yuzuru Noda; Yasuhiro Suzuki, and Toshihide Okamoto, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Ibaraki, Japan

Filed July 9, 1974, Ser. No. 486,932
Claims priority, application Japan, Nov. 9, 1973, 48-126587
Int. Cl.² C08G 73/10
U.S. Cl. 260—47 CP **8 Claims**

1. A water-soluble composition comprising an ammonium salt of a polyimide precursor having a residual acid value ratio of about 3 to 30%, said ammonium salt of said polyimide precursor being obtained by the reaction steps of:

a. reacting 1,2,3,4-butane tetracarbocylic acid and a diamine in about equimolar amounts in a water soluble solvent and, optionally, water at a temperature of from about 60°C to a boiling point of the reaction system to obtain a polyimide precursor and

b. treating said polyamide precursor with ammonia or an aqueous solution of ammonia in an amount at least equimolar to the acid value of the formed polyimide precursor at a temperature of from about 0° to 200°C.

3,925,314
STORAGE-STABLE COMPOSITIONS OF POLYIMIDES AND AZOMETHINES

Alfred Renner, Munchenstein, and Theobald Haug, Frenkendorf, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 381,326, July 20, 1973, abandoned. This application Sept. 3, 1974, Ser. No. 503,025

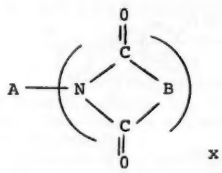
Claims priority, application Switzerland, Oct. 10, 1972, 14888/72

Int. Cl.[2] C08G *73/10*

U.S. Cl. 260—47 UA **12 Claims**

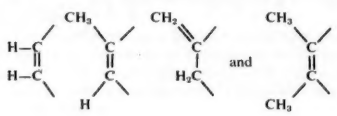
1. A storage-stable, thermosetting composition of matter, which comprises

a. polyimides of certain unsaturated dicarboxylic acids of the general formula I



(I)

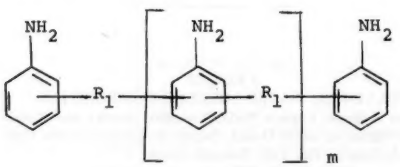
in which A denotes a x-valent organic radical with at least 2 and at most 30 carbon atoms, B represents a radical selected from the formula consisting of



and x denotes the number 2 or 3,

b. polyamines of the formula II or III

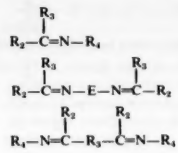
(II)



(III)

wherein, in the formula II, the radical D denotes a y-valent organic radical with 2 to 40 carbon atoms and y represents an integer from 2 to 4 and wherein, in the formula III, the radicals R_1 each denote a divalent hydrocarbon radical of an aldehyde or ketone with 1 to 8 carbon atoms obtained by removal of the oxygen atom and m represents a number from 0.1 to 2, and

c. azomethines of the general formulae IV, V or VI



(IV)

(V)

(VI)

in which R_2 denotes a hydrogen atom, a linear or branched aliphatic hydrocarbon radical with up to 12 carbon atoms, a cycloaliphatic or cycloaliphatic-aliphatic hydrocarbon radical with up to 12 carbon atoms, an aromatic radical with 6 – 12 hydrocarbon atoms, an araliphatic hydrocarbon radical with up to 20 carbon atoms or a heterocyclic radical, R_3 and R_4, with the exception of the meaning of a hydrogen atom, have the same meaning as R_2, and R_3 together with R_2 and with inclusion of the C atom carrying the two substituents can also denote a cycloaliphatic ring system and E denotes a divalent organic radical with at least 2 and at most 30 carbon atoms, the ratio of components (a), (b) and (c) being so chosen that the composition contains 0.1 to 0.85 equivalent of primary amino group and 0.45 to 0.08 equivalent of >C=N group per 1 equivalent of imide group, with the sum of the equivalents of primary amino group and >C=N group amounting to 0.33 to 1 equivalent per 1 equivalent of imide group.

3,925,315
DIGLYCIDYL ETHER OF 4-METHYLOL RESORCINOL

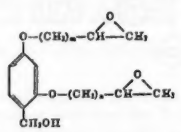
John J. Schmid, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 20, 1974, Ser. No. 507,836

Int. Cl.[2] C08G *30/14*

U.S. Cl. 260—47 EN **6 Claims**

1. A curable epoxy composition comprising an epoxy compound of the formula:



wherein *m* and *n* each have a value of at least 1, and a known epoxide curing agent.

3,925,316
PROCESS FOR THE PREPARATION OF MIXTURES OF CYCLOALKANOLS AND CYCLOALKANONES

Jean-Claude Brunie; Noel Creene, both of Lyon, and Felix Maurel, Villeurbanne, all of France, assignors to Rhone-Poulenc S.A., Paris, France

Filed May 23, 1968, Ser. No. 731,634

Claims priority, application France, May 26, 1967, 67.108082

Int. Cl.[2] C07C *27/04, 29/00, 45/00*

U.S. Cl. 260—586 R **4 Claims**

1. Process for the preparation of a mixture of a cycloalkanol and the corresponding cycloalkanone which comprises heating a solution of a cycloalkylhydroperoxide having 5 to 16 carbon atoms in the ring, in the corresponding cycloalkane, the solution containing, as catalyst, a soluble derivative of vanadium, molybdenum or ruthenium having a solubility of at least 0.1 grams per liter in the cycloalkane at ambient temperature.

3,925,317

ALKENE OXIDE OR ACRYLATE POLYMERIZATION OR COPOLYMERIZATION CATALYZED BY ORGANOALUMINUM-ORGANOPHOSPHINE-METAL SALT OF A BETA-DIKETONE

Henry Hsieh, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 19, 1973, Ser. No. 416,816

Int. Cl.[2] C08F *4/52*; **C08G** *65/26*

U.S. Cl. 260—63 R **22 Claims**

1. A process for the copolymerization of at least one monooxirane compound, and at least one vinyl monomer which is a vinyl ester, vinyl ether, or vinyl ketone, under polymerization conditions, employing a catalyst system consisting essentially of (I) hydrocarbon aluminum compound R_nAlH_m wherein each R is a hydrocarbon radical, n is an integer of 1 to 3, inclusive, and m is zero or an integer of 1 or 2, such that $n + m$ equals 3, (II) triorganophosphine compound R'_3P wherein R' is hydrocarbon or alkoxy-substituted hydrocarbon, and (III) a beta-diketone substantially as the metal salt of said beta-diketone, in catalytically effective ratios,

wherein said metal of said (III) is beryllium, magnesium, calcium, strontium, barium, boron, aluminum, gallium, indium, thallium, germanium, tin, lead, zinc, cadmium, or mercury.

3,925,318

ALKYLATION PROCESS WITH RECOVERY AND REGENERATION OF FLUOROSULFURIC ACID CATALYST

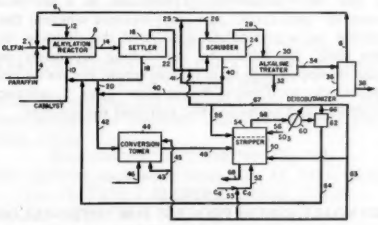
Paul T. Parker, Baton Rouge, La., and Ivan Mayer, Summit, N.J., assignors to Exxon Research & Engineering Company, Linden, N.J.

Continuation of Ser. No. 236,737, March 21, 1974, Pat. No. 3,766,293. This application July 30, 1973, Ser. No. 383,581The portion of the term of this patent subsequent to Oct. 16, 1990, has been disclaimed.

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] C07C *3/54*

U.S. Cl. 260—683.58 **14 Claims**



1. An improved alkylation process comprising:

a. contacting an olefin and a paraffin hydrocarbon in an alkylation reactor with an alkylation catalyst comprising fluorosulfuric acid at alkylation conditions to thereby form a mixture of fluorosulfuric acid phase and a hydrocarbon phase containing alkylation reaction product;

b. settling said mixture into said hydrocarbon phase and said fluorosulfuric acid phase;

c. washing said hydrocarbon phase with an acid comprising sulfuric acid thereby removing at least a portion of the fluorosulfuric acid present in said hydrocarbon phase;

d. separating a sulfuric acid phase containing said fluorosulfuric acid from said hydrocarbon phase containing said alkylation reaction product;

e. contacting said sulfuric acid phase separated in step (d) with water to form an acid-water mixture thereby converting at least a portion of the fluorosulfuric acid contained in said acid phase to hydrogen fluoride and sulfuric acid;

f. stripping hydrogen fluoride from said acid-water mixture of step (e) with a paraffin hydrocarbon thereby forming a hydrocarbon phase containing hydrogen fluoride;

g. treating the hydrocarbon phase from step (f) with sulfur trioxide to regenerate fluorosulfuric acid; and

h. withdrawing said regenerated fluorosulfuric acid from said alkylation process.

3,925,319

LIGHT-STABLE THERMOPLASTIC POLYURETHANES

Norman A. Hiatt, Hamden; Harold G. Wolf, Waterbury, and Robert A. Hlavacek, Stratford, all of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed Sept. 19, 1973, Ser. No. 398,733

Int. Cl.[2] C08G *18/76*; **C09D** *3/72*; **B32B** *27/40*

U.S. Cl. 260—75 NT **9 Claims**

1. A light stable solid thermoplastic polyurethane composition comprising a one-shot reaction product of a macropolyol and a mixture of an aromatic polyisocyanate and an aliphatic polyisocyanate, the equivalence ratio of aromatic to aliphatic polyisocyanate being 50:50, and the overall isocyanate to hydroxyl ratio being from 1:1 to 1.1:1 whereby the solid thermoplastic polyurethane is substantially devoid of free isocyanate groups, the said aromatic polyisocyanate being methylenebis(4-phenylisocyanate) and the said aliphatic polyisocyanate being methylenebis(4-cyclohexylisocyanate).

3,925,320

SOLID CURABLE POLYENE COMPOSITIONS CONTAINING LIQUID POLYTHIOLS AND SOLID STYRENE-ALLYL ALCOHOL COPOLYMER BASED POLYENES

Charles R. Morgan, Silver Spring, Md., assignor to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 250,554, May 5, 1972, abandoned. This application Feb. 8, 1973, Ser. No. 330,818

Int. Cl. C08g *22/04*

U.S. Cl. 260—77.5 CR **9 Claims**

1. A solid curable composition useful for obtaining a solid cross-linked polythioether consisting essentially of:

1. a solid polyene which is the reaction product of a styrene-allyl alcohol copolymer and at least one reactive unsaturated monoisocyanate, said polyene containing at least 2 reactive unsaturated carbon to carbon bonds per molecule; and

2. a liquid polythiol containing at least 2 thiol groups per molecule, the total combined functionality of (1) the reactive unsaturated carbon to carbon bonds per molecule in the polyene and (2) the thiol groups per molecule in the polythiol being greater than 4.

3,925,321

POLYAMIDE COMPOSITIONS WHICH HAVE BEEN RENDERED ANTISTATIC BY THE ADDITION OF SULFOCARBOXYLIC ACID AMIDES

Claus-Rudiger Bernert, Dormagen, and Eduard Radlmann, Dormagen-Hackenbroich, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

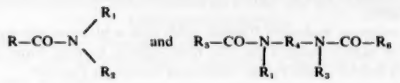
Filed Mar. 7, 1974, Ser. No. 449,101

Claims priority, application Germany, Mar. 7, 1973, 2311329

Int. Cl.[2] C08L *77/10*, *77/02*

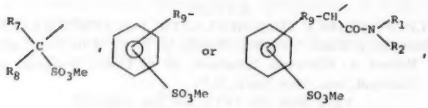
U.S. Cl. 260—78 S **3 Claims**

1. Antistatic film and fiber-forming polyamide composition consisting essentially of an aliphatic polyamide and 0.5 – 20 percent by weight, based on the polyamide composition, of a sulphonatocarboxylic acid amide of the general formulae

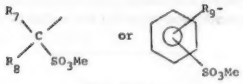


wherein

R denotes a group of the general formulae



R_5 and R_6 denote groups of the general formulae



and

R_1 denotes a short chain alkyl group containing 1 to 5 carbon atoms,

R_2 and R_8 denote long chained alkyl groups containing 4 to 30 carbon atoms,

R_3 and R_7 denote hydrogen or short chain alkyl groups containing 1 to 5 carbon atoms,

R_4 denotes a straight chained or branched chain alkylene group containing 1 to 18 carbon atoms,

R_9 denotes a straight chain or branched chain alkylene group containing 0 to 3 carbon atoms and Me denotes alkali metals.

3,925,322

ANAEROBIC CURABLE COMPOSITIONS

Kishiro Azuma; Isao Tsuji; Hiroyuki Kato; Hidemaro Tatemichi; Akira Motegi; Osamu Suzuki, and Kishichiro Kondo, all of Nagoya, Japan, assignors to Toagosei Chemical Industry Co., Ltd., Tokyo, Japan

Filed Jan. 4, 1974, Ser. No. 430,782

Claims priority, application Japan, Jan. 19, 1973, 48-8419

Int. Cl.[2] C08F *18/14, 18/16, 22/14, 120/20*

U.S. Cl. 260—78.4 E **8 Claims**

1. An anaerobic curable composition comprising a hydroperoxide in the amount 0.01–5% by weight based on said composition, a 1,1-dialkylhydrazine or its acid salt in the amount 0.001–5% by weight based on said composition, the alkyl groups making up said dialkylhydrazine being a C_1–C_4 alkyl, and the remainder of said composition comprising essentially a polyesterpolyacrylate and/or a polyesterpolymethacrylate or an anaerobic curable monomer mixture containing said polyesterpolyacrylate and/or said polyesterpolymethacrylate.

3,925,323

POLY(META-PHENYLENE ISOPHTHALAMIDE)POWDER

John William Turnbull, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 14, 1972, Ser. No. 262,599

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] C08G *69/46*

U.S. Cl. 260—78 S **6 Claims**

1. A coalescible and densifiable powder of poly(meta-phenylene isophthalamide) characterized by a density of at least about 1.0 g./cc. when pressed into a preform and a density when sintered of at least about 1.24 g./cc. produced by adding a solution of between about 0.5 and about 3.5 percent by weight, based upon the total weight of said solution, of poly(meta-phenylene isophthalamide) in a solvent selected from any of the group consisting of dimethylformamide and dimethylacetamide to water to form a slurry and agitating said slurry and thereafter filtering said slurry to recover solid particles of said poly(meta-phenylene isophthalamide), and washing and drying said solid particles and comminuting said solid particles whereby to provide said coalescible and densifiable powder of poly(meta-phenylene isophthalamide).

3,925,324

PROCESS FOR THE PREPARATION OF THERMOSETTING POLYMERS FROM N,N-BIS-MALEIMIDE

Bernard Gerard, Lyon, France, assignor to Rhone-Poulenc S.A., Paris, France

Filed Dec. 20, 1972, Ser. No. 317,080

Claims priority, application France, Dec. 27, 1971, 71.46753

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] C08L *73/12*

U.S. Cl. 260—78 UA **6 Claims**

1. In a continuous process for the preparation of a thermosetting prepolymer by heating a mixture of an N,N'-bis-maleimide and bis-(4-amino-phenyl)-methane at a temperature between 95° and 250°C., the improvement wherein the bis-maleimide, as a particulate solid, and the diamine, in the molten state, are mixed by introducing separately into a kneader equipped with an extrusion screw, the molar ratio of bis-maleimide to diamine being from 1 to 5, advancing, polymerising and collecting the extruded prepolymer.

3,925,325

ORGANOALUMINUM PROCESS FOR IMIDE-ALCOHOL CONDENSATION

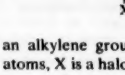
Robert Arthur Heimsch, St. Louis, and Edward Hugo Mottus, Ballwin, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed July 22, 1974, Ser. No. 490,440

Int. Cl.[2] C08G *69/16*

U.S. Cl. 260—78 L **10 Claims**

1. A catalyzed imide-alcohol condensation process for the preparation of polymeric compounds of polyester-polyamides comprising: contacting alcohols having one or more hydroxyl groups attached to an aliphatic carbon, and acyl lactams in the presence of an organoaluminum catalyst having the formula:



wherein R is an alkylene group having from one to about fifteen carbon atoms, X is a halogen, and *n* is an integer of one or more.

3,925,326

ALTERNATING COPOLYMERS OF ETHYLENE/ALKYL ACRYLATES/CURE-SITE MONOMERS AND A PROCESS FOR THEIR PREPARATION

Anestis Leonidas Logothetis, Louisville, Ky., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 132,177, April 7, 1971, abandoned. This application Mar. 10, 1972, Ser. No. 233,741

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

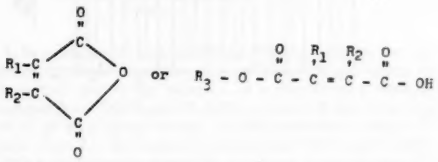
Int. Cl.² C08F *15/00*

U.S. Cl. 260—78.5 R **14 Claims**

1. An amorphous substantially linear atactic alternating copolymer having a glass transition temperature less than about 0°C. and an inherent viscosity of about 1–6 (measured on a 0.1 wt. % solution in chloroform at 30°C.), said copolymer having repeating units consisting essentially of:

—A—B—

wherein A is independently selected from at least one alkyl acrylate, said alkyl group having from 1–8 carbon atoms and an acrylic cure-site monomer, and B is ethylene, said cure-site monomers having the formulae:



wherein R_1 and R_2 are independently selected from H, Cl, Br, a C_1–C_8 alkyl, phenyl, or naphthyl, and R_3 is hydrogen, C_1–C_{10} alkyl, phenyl or naphthyl, substituted phenyl or naphthyl where substituents are alkyl C_1–C_{10}, halogen, nitro, and C_1–C_{10} alkoxy groups,

the mole percent alkyl acrylate plus cure-site monomer in the copolymer is about 50, the balance being ethylene.

3,925,327

METHOD FOR PRODUCING VINYL ACETATE-ETHYLENE-DICARBOXYLIC ACID DIALLYL ESTER COPOLYMER

Hirotsugu Mitsushima, and Motohiro Katata, both of Ichihara, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Nov. 15, 1972, Ser. No. 306,582

Claims priority, application Japan, Nov. 15, 1971, 46-91773

Int. Cl.² C08F *2/30, 210/02, 218/08, 218/18*

U.S. Cl. 260—78.5 UA **7 Claims**

1. A method for producing a vinyl acetate-ethylene-dicarboxylic acid diallyl ester copolymer having an intrinsic viscosity of about 0.2 to about 3.0 at 30°C. in benzene which comprises emulsion-polymerizing a monomeric mixture consisting essentially of vinyl acetate, ethylene and a dicarboxylic acid diallyl ester in water with an emulsifier in the presence of a water-soluble radical initiator at a temperature of 30° to 80°C. under an ethylene pressure of 0 to 100 atm, said dicarboxylic acid diallyl ester being employed in an amount of 0.01 to 2 mole % based on the total amount of reactants and being an aliphatic dicarboxylic acid diallyl ester of the formula:

$$H_2C{=}HC{-}H_2COOC_nH_mCOOCH_2{-}CH{=}CH_2$$

wherein *n* represents an integer of 2 to 10 and *m* represents 2*n* or 2*n*−2, an aromatic dicarboxylic acid diallyl ester or a mixture thereof, the average degree of polymerization of the resulting copolymer being controlled by the use of said diallyl ester in the polymerizing mixture.

3,925,328

SURFACE SIZING COMPOSITIONS

Yasuo Shibahara, and Yoichi Tominaga, both of Kyoto, Japan, assignors to Sanyo Chemical Industries, Ltd., Kyoto, Japan

Filed Nov. 2, 1973, Ser. No. 412,350

Claims priority, application Japan, Nov. 15, 1972, 47-115078

Int. Cl.² C08F *8/44*

U.S. Cl. 260—78.5 T **14 Claims**

1. A surface sizing composition for paper, which comprises: a copolymer of styrene and at least one unsaturated carboxylic compound selected from the group consisting of maleic acid, maleic anhydride and half esters of maleic acid, wherein said copolymer has a carboxylate equivalent of 80 – 300 based on the free carboxylic acid form, and wherein said copolymer has 5 – 50% of its total carboxylic groups as alkali metal salts and 95 – 50% of its total carboxylic groups as at least one non-metal salt selected from the group consisting of ammonium salts and lower alkyl amine salts.

3,925,329

PRODUCTION OF POLYMERS IN POWDERED FORM WHICH CONTAIN CARBOXYLIC ACID OR CARBOXYLIC ANHYDRIDE GROUPS

Bernhard Heinrich, Frankenthal; Herbert Naarmann, Wattenheim, and Peter Thoma, Frankenthal, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Dec. 28, 1973, Ser. No. 429,133

Int. Cl.² C08F *2/14, 6/10*

U.S. Cl. 260—78.5 R **8 Claims**

1. A process for the production in powdered form of a polymer containing carboxylic acid or carboxylic anhydride groups which comprises polymerizing acrylic acid, methacrylic acid or maleic anhydride with one or more than one other monomers selected from the group consisting of styrene and esters of acrylic acid and methacrylic acid with alcohols of the structure $HO{-}CH_2{-}R$ wherein R is hydrogen, alkyl of from one to five carbons, benzyl, $CH_2{-}NR_2$ or $CH_2{-}CH_2{-}NR_2$, in such amounts that the resulting copolymers contain from 5 to 40% by weight of the monomers containing carboxylic acid groups or from 10 to 50% by weight of maleic anhydride, said polymerization being conducted at a temperature of from 70° to 150°C and in the presence of an alcohol or hydrocarbon auxiliary liquid having a boiling point of from 70° to 150°C, wherein the ratio by weight of monomers to auxiliary liquid is from 0.5:1 to 1.5:1, and wherein the surface area of the mixture in the reaction zone is increased by mechanical stirring to at least twenty times that of the unstirred mixture, and distilling off the auxiliary liquid while stirring after the mixture has reached a viscosity of at least 20,000 centipoises measured at 20°C.

3,925,330

CASTABLE COMPOSITIONS CONTAINING UNSATURATED LIQUID VINYLIDENE-TERMINATED POLYMERS

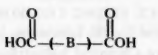
William J. McCarthy, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jan. 7, 1974, Ser. No. 431,076

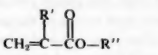
Int. Cl.² C08F *2/00, 222/10, 236/20*

U.S. Cl. 260—78.5 B **7 Claims**

1. Castable compositions comprising (1) a liquid vinylidene-terminated polymer being the reaction product of (a) a liquid carboxyl-terminated polymer of the structure



where B consists of interpolymerized units of about 20 percent to about 100 percent by weight of a diene monomer containing 4 to about 10 carbon atoms in the molecule, and up to 80 percent by weight of a vinyl monomer selected from the group consisting of vinyl aromatics, vinyl nitriles, vinyl acids, vinyl and allyl alcohols, vinyl and allyl esters, vinyl and allyl ethers, divinyls, diacrylates, and acrylic esters of the formula



wherein R′ is —H, —CH_3 or —C_2H_5, and R″ is an alkyl radical containing 1 to 18 carbon atoms or an alkoxyalkyl, alkylthioalkyl, or cyanoalkyl radical containing 2 to about 12 carbon atoms with (b) a compound containing a vinylidene group and an epoxide group selected from the group consisting of isopropenyl glycidyl ether, allyl glycidyl ether, methallyl glycidyl ether, glycidyl acrylate, and glycidyl methacrylate, (2) from about 20 parts to about 180 parts by weight of a polymerizable vinyl monomer and (3) from about 0.1 part to about 5 parts by weight of a free-radical catalyst system, the parts by weight of (2) and (3) based on 100 parts by weight of (1).

3,925,331
POLYMERIC SEALANTS

Christopher Scott Ely, Oldbury, England, assignor to Albright & Wilson Ltd., Oldbury, England

Continuation-in-part of Ser. No. 410,700, Oct. 29, 1973, Pat. No. 3,872,059, which is a continuation of Ser. No. 259,935, June 5, 1972, abandoned. This application Nov. 27, 1973, Ser. No. 419,378

Claims priority, application United Kingdom, June 3, 1971, 18910/71; Dec. 1, 1972, 55695/72The portion of the term of this patent subsequent to Mar. 18, 1992, has been disclaimed.

Int. Cl.² C08G *75/14, 75/16*

U.S. Cl. 260—79 **41 Claims**

1. A moisture curable sealant composition maintained under anhydrous conditions and containing unreacted SH groups and in the absence of peroxides or tin compounds, said sealant comprising the product of reacting under anhydrous conditions (i) a polysulphide of the statistical formula

$$HS[(-CH_2(R')_bCH_2S_a-)_c(-R''S_a-)_d(SH)_f]CH_2(R')_bCH_2SH$$

where

a is 1–5,

b is 0 or 1

c is 1–200

d is 0 up to 0.05c,

f is subject to the conditions 0.05c is equal to or larger than *f*, *f* is equal to or larger than *d*, and *f* is equal to or less than 1, and *f*=*d* multiplied by the (No. of free valencies in R″ −2) R′ is —O—, —S— or an organic divalent radical free of aliphatic unsaturation selected from the group consisting of radicals containing only C and H atoms and radicals containing C and H atoms and at least one of O and S atomsin the form of —C—O—C, —OH or —C—S_a—C— links, R″ is an organic radical free of aliphatic unsaturation having at least 3 free valencies and selected from the group consisting of radicals containing C and H atoms only and radicals containing C and H atoms and at least one of O and S atoms in the form of —C—O—C, —OH or —C—S_a —C— links, and the free valencies being for carrying all the *f* SH groups and the $CH_2R'_bCH_2S_a$ and R″S_a groups being in any order, with (ii) an amount of a silane of the formula Q_nSiX_{4-n}, where *n* is 1 or 2, Q is an organic group having an epoxide group, an organic group having a mercapto group $CH_2 = CR_{14}COO\ C_{m+1}\ H_{2m+2}$ — or $CH_2 = CR_{15} - C_m\ H_{2m}$ — group, where *m* is 0, 1, 2 or 3, each of R_{14} and R_{15} which are the same or different, is hydrogen or is an alkyl radical of 1 to 4 carbon atoms, and at least two X's are organic hydrolyzable groups and the remaining group X (if any) is an alkyl group of 1 to 6 carbon atoms, or a chloro alkyl radical of 1 to 6 carbon atoms, the silane having a total of only 1 or 2 groups, which react with SH in the polysulphide under the reaction conditions, sufficient to react with from 3% to 30% of the SH groups of said polysulphide, and the reaction with a silane containing a mercapto group being carried out in the presence of a base of pK at least 9.

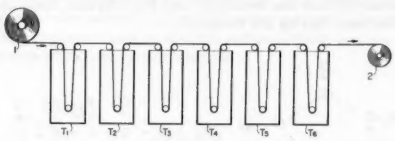
3,925,332
HYDROPHILIC MEMBRANE AND PROCESS FOR THE PREPARATION THEREOF

Hirokuni Naito, Hino; Isao Yoshimura, Fujisawa, and Hiroo Nakano, Kawasaki, all of Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

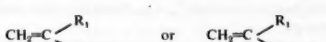
Filed June 18, 1974, Ser. No. 480,579

Int. Cl.² C08F *28/00;* **C08G** *75/00*

U.S. Cl. 260—79.3 R **11 Claims**



1. A hydrophilic membrane of a sulfonated product of a film or tube made of a polymeric composition comprising a copolymer of ethylene with 3.0 to 18.0 mole % of a comonomer of the formula



wherein R_1 is hydrogen or a methyl group, R_2 is an alkyl group with 1 to 5 carbon atoms and R_3 is hydrogen or an alkyl group with 1 to 6 carbon atoms, or an ionically crosslinked derivative of such a copolymer when R_3 is hydrogen, said membrane containing sulfonic acid groups or salts thereof in an amount of 0.5 to 4.0 milliequivalents per gram of dry membrane, having excellent alkali resistance and having an effective resistivity of 0.002 to 2 Ω.cm² and a folding endurance of at least 100 times.

3,925,333
OLEFINIC POLYMERS OF METHYL-TRICYCLO-3,8-DECADIENE

Alberto Valvassori, Milan, Italy; Guido Sartori, Roselle, N.J., and Nazzareno Cameli, Milan, Italy, assignors to The B. F. Goodrich Company, Akron, Ohio

Continuation of Ser. No. 868,943, Oct. 23, 1969, abandoned, which is a continuation of Ser. No. 646,468, June 16, 1967, abandoned. This application Feb. 5, 1971, Ser. No. 113,055

Claims priority, application Italy, June 17, 1966, 19149/66

Int. Cl.² C08D *9/00, 3/02*

U.S. Cl. 260—79.5 B **8 Claims**

1. Substantially linear, amorphous, unsaturated copolymers consisting of macromolecules made up of polymerized units of ethylene, polymerized units of at least one aliphatic 1-olefin of the general formula R — CH = CH_2, wherein R is an alkyl group containing 1 to 6 carbon atoms, and polymerized units of at least one of 3-methyl-tricyclo[5,2,1,$0^{2,6}$]-3,8-decadiene and 4-methyl-tricyclo-[5,2,1,$0^{2,6}$]-3,8-decadiene, said copolymers having a molecular weight higher than 20,000 and containing, by mols, from 5 percent to about 75 percent of ethylene, from about 0.1 to about 20 percent of the diene, and the balance aliphatic alpha-olefin.

3,925,334
PROCESS FOR PREPARING ETHYLENE/PROPYLENE/1,4-HEXADIENE ELASTOMERIC TERPOLYMERS USING CATALYST PREPARED IN A WIPED-WALL CATALYST PREMIXER

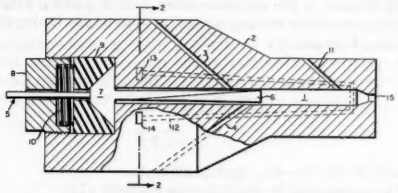
Herbert Felix Mc Shane, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 19, 1973, Ser. No. 342,423

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] C08F *2/06, 4/68, 36/20*

U.S. Cl. 260—80.78 **17 Claims**



1. In a continuous process for the solution interpolymerization of ethylene, propylene, and 1,4-hexadiene monomers in the reactor and in the presence of a coordination catalyst prepared from $VOCl_3$ and R_xAlCl_{3-x}, where R is a C_4 to C_{12} and is an alkyl group having a β-alkyl substituent and x is about 1.6 to 2.0, the improvement wherein $VOCl_3$ and R_xAlCl_{3-x} are continuously premixed in solvent in the absence of monomer in a wiped-wall catalyst premixer to prepare catalyst solution having an aluminum to vanadium atomic ratio of about 1.6 to 2.8 and a concentration of about 20 to 50 millimoles vanadium per liter of solvent, and the premixed catalyst solution is continuously injected into the reactor as it is formed.

3,925,335
VINYL URETHANE RESINS FROM HALOGENATED DIOLS AND PHOSPHONATE DIOLS

Erich Kuehn, Wilmington, Del., assignor to ICI United States Inc., Wilmington, Del.

Filed May 29, 1973, Ser. No. 364,910

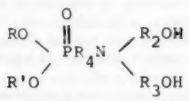
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] C08L *75/00*

U.S. Cl. 260—859 R **18 Claims**

1. A composition comprising

a. a vinyl urethane resin comprising the reaction product of a mixture of a halogen-containing diol and a phosphonate having the formula:



wherein R and R′ are selected from the group consisting of allyl, lower alkyl, and lower haloalkyl radicals; and R_2, R_3, and R_4 are lower alkylene or lower haloalkyl radicals, provided that either R_2 or R_3 must be an alkylene radical, wherein the amount of phosphonate in said mixture is such that the molar ratio of diol to phosphonate is equal to from about 0.4/0.6 to about 0.9/0.1; an isocyanate having a functionality equal to from about 2.0 to about 3.0; and a hydroxyl terminated ester of acrylic or methacrylic acid; provided that, (i) when the amount of the mixture of diol and phosphonate is equal to up to 1 mole the amount of the isocyanate is equal to about 2 moles per mole of the mixture and the amount of the hydroxyl terminated ester is equal to about 2 moles per mole of the mixture, and (ii) when the amount of the mixture of diol and phosphonate is equal to greater than 1 mole, the amount of isocyanate is equal to about 1 mole plus 1 mole per mole of the mixture and the amount of the hydroxyl terminated ester is equal to about 2 moles; and

b. a monomer selected from the group consisting of styrene, t-butyl styrene, alpha methyl styrene, chlorostyrene, divinyl benzene, acrylic acid, dimethyl maleate, dibutyl fumarate, butyl methacrylate, nonyl methacrylate, and allyl alcohol.

3,925,336
PROCESS FOR PREPARING GRANULAR ETHYLENE-VINYL ALCOHOL COPOLYMER

Atsuo Sawada, Ogaki, Japan, assignor to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed June 7, 1974, Ser. No. 477,419

Int. Cl.[2] C08F *210/00, 212/00, 220/00, 222/00*

U.S. Cl. 260—87.3 **12 Claims**

1. In a process for preparing ethylene-vinyl alcohol copolymer by hydrolyzing ethylene-vinyl acetate copolymer in the presence of a hydrolyzing catalyst, the improvement which comprises

a. forming a solution containing a lower alkyl alcohol having 1 to 4 carbon atoms and an ethylene-vinyl acetate copolymer, said copolymer having an ethylene content of 5 to 85% by mole and a vinyl acetate content of 95 to 15% by mole,

b. suspending the solution in a non-solvent which is substantially incapable of dissolving the ethylene-vinyl acetate copolymer and the ethylene-vinyl alcohol copolymer and is immiscible with the lower alkyl alcohol and lower alkyl acetate corresponding to the lower alkyl alcohol,

c. mixing together the solution and non-solvent in the presence of a hydrolyzing catalyst at a temperature in the range frorm 20° to 60°C such that not less than 80% by mole of the vinyl acetate is hydrolyzed to form ethylene-vinyl alcohol copolymer granules, and

d. separating the granules from the solution-non-solvent mixture said granular ethylene-vinyl alcohol copolymer having a uniform size and being spherical without the need for employing a crushing step.

3,925,337
POST CHLORINATED VINYL CHLORIDE COPOLYMERS

Charles A. Heiberger, Princeton, N.J., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation of Ser. No. 846,417, July 31, 1969, abandoned. This application July 21, 1972, Ser. No. 273,936

Int. Cl. C08f *15/02*

U.S. Cl. 260—87.5 C **6 Claims**

1. A post-chlorinated vinyl chloride-propylene copolymer having a heat deflection temperature of at least 185°F, a chlorine content of 60% to 73% by weight and a melt flow value of from 0.1 dg./min. to 250 dg./min. said post-chlorinated copolymer prepared from a vinyl chloride-propylene copolymer having a propylene content of from about 2% to about 12% by weight, a vinyl chloride content of from about 88% to about 98% by weight, an intrinsic viscosity of 0.45 dl./g. to 1.2 dl./g. and a melt flow value of 0.3 to 1000 dg./min.

3,925,338

CONTROL OF POLYMER PARTICLE SIZE IN OLEFIN POLYMERIZATION

Morris R. Ort, Seabrook, Tex., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 16, 1973, Ser. No. 341,837
Int. Cl.[2] C08F 2/34, 10/02, 110/02, 210/16
U.S. Cl. 260—88.2 R 11 Claims

1. A process for producing homopolymers and copolymers of ethylene in the gas-phase which comprises contacting a gas stream containing ethylene under polymerization conditions with a Ziegler-type catalyst deposited on a solid support in a fluidized bed operation and controlling the particle size of the polymer product by determining the average particle size of the polymer produced and decreasing the average particle size of the catalyst support if the average particle size of the polymer product is too large and increasing the average particle size of the catalyst support if the average particle size of the polymer product is too small.

3,925,339

SHAPED ARTICLES OF POLYVINYLIDENE FLUORIDE

Hajime Ishii; Nubuo Bannai, and Sadao Nishita, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo K.K., Tokyo, Japan

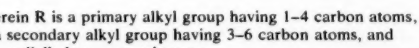
Division of Ser. No. 3,204, Jan. 15, 1970, Pat. No. 3,707,592, and a continuation-in-part of Ser. No. 501,888, Oct. 22, 1965, abandoned. This application Sept. 22, 1972, Ser. No. 291,694
Claims priority, application Japan, Oct. 21, 1964, 39-59812; Sept. 18, 1965, 40-57016
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] C08F 14/22
U.S. Cl. 260—92.1 3 Claims

1. A shaped article of polyvinylidene fluoride having improved heat-resistance, mechanical stability, and dimensional stability, said shaped article having been prepared by polymerizing vinylidene fluoride at a temperature between 0° and 30°C in a water medium in the presence of a catalyst selected from the group consisting of

1. a dialkyl peroxydicarbonate represented by the following general formula

wherein R is a primary alkyl group having 1–4 carbon atoms, or a secondary alkyl group having 3–6 carbon atoms, and

2. a dialkyl peroxy carbonate



wherein R is a primary alkyl group having 1 to 3 carbon atoms or a secondary alkyl group having 4 to 6 carbon atoms and R′ is a primary alkyl group having 1 to 3 carbon atoms or a secondary alkyl group having 3 to 5 carbon atoms, and in the presence of a chain transfer agent selected from the group consisting of chloroform, n-hexane, and cyclohexane to control the degree of polymerization, thereby obtaining a polyvinylidene fluoride resin having a melting point of between 185° and 190°C, a crystallization temperature of from 135° to 146°C, and an inherent viscosity of from 0.4 to 1.20; and melt extruding said polymer at a temperature of about 250°C and above to produce a pre-formed article of a film or fiber and stretching the pre-formed article at a temperature between 80° and 130°C and at a draw ratio of at least 150 percent to form a film or fiber having an intensity ratio of at most 1.3.

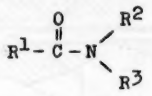
3,925,340

PREPARATION OF SOL CHLOROPRENE POLYMERS

Ausat Ali Khan, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

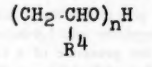
Filed May 8, 1974, Ser. No. 468,198
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] C08F 113/16, 200/00, 220/42, 214/00
U.S. Cl. 260—92.3 8 Claims

1. In the process of polymerizing in the presence of a C_8—C_{20} alkyl mercaptan in aqueous emulsion at a pH of about 10–13 chloroprene containing from 0 to about equal weight of a copolymerizable monomer at a temperature from the freezing point of the emulsion to about 52°C., the improvement of having present in the emulsion about 0.05–1 part by weight per 100 parts of the starting monomer, of an amide having the following Formula (1)



wherein R^1 is a C_7—C_{19} alkyl or alkenyl,

R^2 is represented by the following Formula (2):



wherein *n* is a number having an average value of 1 to about 50, and

R^4 in each parenthetical unit is independently of any other such unit hydrogen or methyl; and

R^3 is hydrogen, phenyl, benzyl, a C_1—C_5 alkyl, or a radical of the above Formula (2);

with the provisos that when R^3 has the above Formula (2), the sum of the average values of *n* in R^2 and R^3 is at most about 50; and when R^1 is alkenyl, the double bond is separated from the nitrogen atom by at least one saturated carbon atom.

3,925,341

PROCESS FOR WORKING UP PARTICULATE POLYOLEFINS OBTAINED BY POLYMERIZATION CARRIED OUT WITH THE AID OF ZIEGLER/NATTA CATALYSTS

Heinz Mueller-Tamm, Ludwigshafen; Hannes Schick, Mannheim; Wolfgang Rau, Heidelberg, and Peter Hennenberger, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Nov. 26, 1973, Ser. No. 419,060
Claims priority, application Germany, Nov. 29, 1972, 2258345
Int. Cl.[2] C08F 6/00, 6/28
U.S. Cl. 260—93.7 7 Claims

1. A process for working up particulate polyolefins in an extruder, said particulate polyolefins having been obtained by gas phase polymerization with the aid of Ziegler/Natta catalysts and having a particle diameter of less than 5 mm, said process consisting essentially of:

a. continuously introducing said particulate polyolefin into a melting zone wherein sufficient heat is applied to melt said polyolefin;

b. adding to said particulate polyolefin before it reaches said melting zone or within said melting zone,

1. a C_2- C_6 alkenoxide, and

2. water,

the amount of said alkenoxide being from 3 to 50 parts by weight per 1,000 parts of polyolefin and the amount of water being from 0.5 to 20 parts by weight per 1,000 parts of polyolefin;

c. passing said molten polyolefin to which said oxide and said water have been added to a degassing zone wherein volatiles are driven off under a vacuum of from 0.1 to 500

millibars to substantially reduce the halogen content of said polyolefin;

d. transferring the degassed polyolefin to a discharge zone; and thereafter,

e. extruding and granulating the resulting polyolefin.

3,925,342

POLYMERIZATION OF UNSATURATED FATTY MATERIALS

Roland Pierre Franz Scharrer, Pelham, N.Y., assignor to Arizona Chemical Company, New York, N.Y.

Filed Oct. 15, 1973, Ser. No. 406,736

Int. Cl.[2] C09F *7/06*

U.S. Cl. 260—97.5 **7 Claims**

1. A process for the polymerization of fatty material which comprises heating in the presence of a steam blanket a fatty acid material containing both a carboxylic acid group and a major amount of diene linkages therein in the presence of an effective amount of a catalyst having the structure:

where *n* is an integer from 1 to 4, *y* is an integer from 1 to 3, R is a C_1-C_{10} hydrocarbon group, said group being alkyl, cycloalkyl, cycloalkyl substituted alkyl, aryl substituted alkyl or alkaryl substituted alkyl, *m* is an integer from 0 to 4 and the sum of *m*, *n* and *y* cannot exceed the substitutable positions on the aryl ring, said aryl ring being phenyl, naphthyl or phenanthryl and wherein at least one of said hydroxyl and said mercaptan groups are ortho positioned on the same aryl ring.

3,925,343

READILY DISPERSIBLE DRY GLUTEN PRODUCT AND USES THEREOF

Richard John Hampton, Pierrefonds; Jacques Robert Rolland, Bouchardville, and Thomas Gallo, Toronto, all of Canada, assignors to Ogilvie Flour Mills Company Limited, Montreal, Canada

Continuation-in-part of Ser. No. 309,656, Nov. 27, 1972, abandoned, which is a continuation of Ser. No. 26,405, April 7, 1970, Pat. No. 3,704,131. This application Jan. 7, 1974, Ser. No. 431,318The portion of the term of this patent subsequent to Nov. 28, 1989, has been disclaimed.

Int. Cl.[2] A23J *3/00*

U.S. Cl. 260—112 G **4 Claims**

1. A dry vital wheat gluten product in the form of coarse, porous, irregularly-shaped agglomerates having a moisture content of between about 6 and 10 percent and composed of a multiplicity of individual gluten particles adhered together in a random form and array, the major proportion of the agglomerates having a particle size exceeding 149 microns and up to a maximum of 500 microns, and said agglomerated gluten product being further characterised by the ease with which it can be dispersed in neutral aqueous dispersion having a pH between about 4 and about 8 by simply stirring to form a relatively stable dispersion in such a medium.

3,925,344

PLASMA PROTEIN SUBSTITUTE

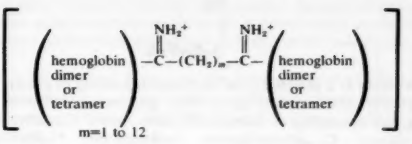
Abraham Mazur, New York, N.Y., assignor to The Community Blood Council of Greater New York, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 350,225, April 11, 1973, abandoned. This application Feb. 13, 1974, Ser. No. 442,276

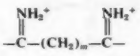
Int. Cl.[2] C07C *103/52*; **A61K** *37/00*

U.S. Cl. 260—112.5 **23 Claims**

1. A plasma protein substitute comprising a hemoglobin containing material in polymeric form, said polymer having the following repeating unit:



said polymer having an average molecular weight of between 68,000 and 600,000, the



moiety being joined to the hemoglobin dimer or tetramer group through epsilon amino groups of lysyl residues of the hemoglobin dimer or tetramer.

3,925,345

[SAR[1],THR[8]]ANGIOTENSIN II AS AN ANGIOTENSIN ANTAGONIST

Francis Merlin Bumpus, 75 Winterberry Lane, Chagrin Falls, Ohio 44022; Mahesh Chandra Khosla, 415 Warwick Lane, Chesterland, Ohio 44026, and Robert Rudolph Smeby, 36801 Riviera Road, Willoughby, Ohio 44094

Filed May 10, 1974, Ser. No. 468,853

Int. Cl.[2] C07C *103/52*; **A61K** *37/00*

U.S. Cl. 260—112.5 **1 Claim**

1. The octapeptide Sar-L-Arg-L-Val-L-Tyr-L-Ile-L-His-L-Pro-L-Thr.

3,925,346

MIXED CHROMIUM-CONTAINING AZO DYESTUFFS CONTAINING, PER ATOM OF CHROMIUM, ONE MOLECULE OF AN O,O'-DIHYDROXY-SULPHOPHENYLENE-AZO-NAPHTHALENE AND ONE MOLECULE OF AN -O-HYDROXYPHENYLENE-AZO-ACETOACETAMIDE

Arthur Buehler, Rheinfelden, and Hans-Ulrich Schuetz, Basel, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation-in-part of Ser. No. 820,334, April 29, 1969, abandoned. This application Oct. 19, 1971, Ser. No. 190,679

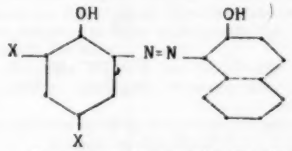
Claims priority, application Switzerland, May 14, 1968, 7130/68

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

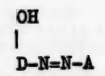
Int. Cl.[2] C09B *45/06*; **D06P** *3/00*, *3/04*

U.S. Cl. 260—145 A **7 Claims**

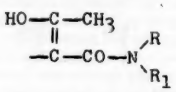
1. A metal compound that contains one atom of chromium bound in complex union with one molecule each of two different monoazo dyestuffs, one of which corresponds to the formula



in which one X represents nitro and the other X is sulphonic acid, and the other monoazo dyestuff corresponds to the formula



wherein D is selected from the group consisting of phenyl and phenyl substituted by up to three groups selected from the group consisting of chlorine bromine, nitro, C_{1-5}alkyl, C_{1-5}alkoxy, C_{1-4}alkanoylamino, sulfonamido, N-phenylsulfonamido and N-(carboxyphenyl)-sulfonamido; and A is an acetoacetamide group of the formula



wherein R and R_1 are each independently hydrogen, C_{1-5}alkyl, C_{1-5}alkoxyalkyl, phenyl-C_{1-2}alkyl, cyclopentyl, cyclohexyl, phenyl and phenyl substituted by up to two groups selected from the group consisting of C_{1-5}alkoxy, C_{1-5}alkyl, chlorine and bromine.

3,925,347

PROCESSES OF SYNTHESIZING AZO COMPOUNDS

Paul S. Huyffer, Lynnfield, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

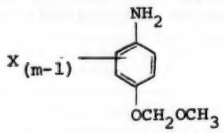
Continuation of Ser. No. 655,306, July 24, 1967, abandoned. This application Mar. 30, 1970, Ser. No. 22,114

Int. Cl.[2] C07C *107/04*

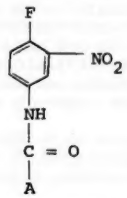
U.S. Cl. 260—147 **5 Claims**

1. A process which comprises the steps of:

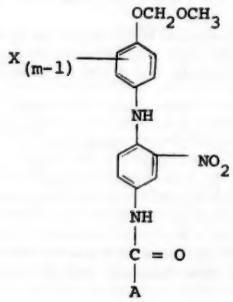
a. reacting a compound of the formula:



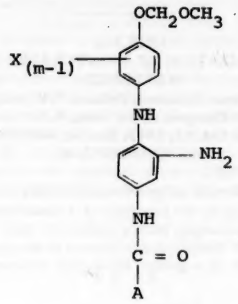
with a compound of the formula:



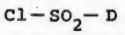
to form a compound of the formula:



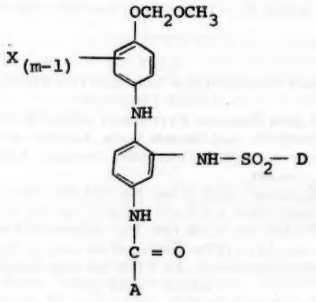
b. reducing the nitro group of said last-named compound to form a compound of the formula:



c. reacting said last-named compound with a dye salt of the formula:

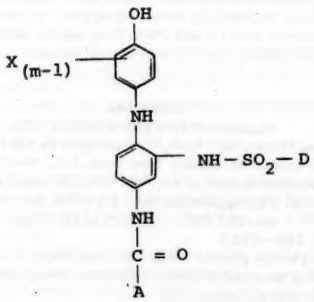


to form a compound of the formula:



and

d. removing said $-CH_2OCH_3$ group to form a compound of the formula:



wherein:

X is methyl, methoxy, hydroxy, amino, chloro or carboxy;

m is a positive integer from 1 to 2;

A is an alkyl radical having from 9–17 carbon atoms; and

D is an azo dye moiety.

3,925,348

AZONAPHTHIMIDAZOLE COMPOUNDS

Alexander Wohlkonig, Arlesheim; Peter Hindermann, Bottmingen; Fabio Beffa, Riehen, and Gert Hegar, Schonenbuch, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

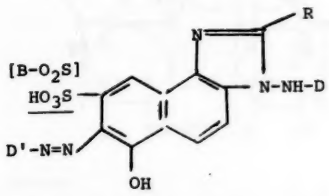
Filed Sept. 29, 1972, Ser. No. 293,632

Claims priority, application Switzerland, Oct. 1, 1971, 14348/71; Sept. 4, 1972, 12983/72

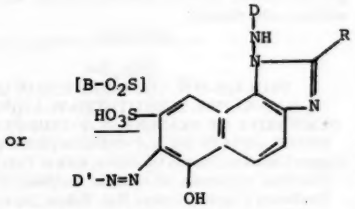
Int. Cl.² C09B *29/36*

U.S. Cl. 260—157 **3 Claims**

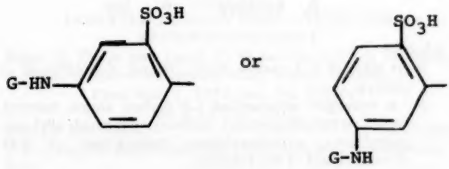
1. A 1H- or 3H-naphtho-(1,2-d)imidazole dyestuff of the formula



or

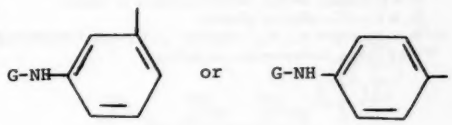


wherein D and D' are each independently phenyl or phenyl substituted by chloro, bromo, nitro, cyano, methylsulphonyl, carboethoxy, carbomethoxy, methyl, trifluoromethyl, β-hydroxyethylsulphonyl, β-chloroethylsulphonyl, carbocyclohexyloxy, sulphonamido, N-alkyl or N-di-alkyl sulphonamido in which alkyl contains 1–4 carbon atoms, N-oxy- or N,N-dioxy-lower alkyl sulphonamido in which alkyl contains 1 to 3 carbon atoms, N-ethyl-N-phenylsulphonamido, N-methyl-N-cyclohexyl sulphonamido, N-phenylmethyl sulphonamido or N,β-methoxyethylsulphonamido or a group of the formula



wherein G is acetyl, propionyl, isopropionyl, benzoyl, chloro-, bromo- or nitro- substituted benzoyl, α-chloroacetyl, acryloyl, α-chloro- or bromacryloyl or α,β-dichloro- or dibromopropionyl;

R is alkyl having 1 to 6 carbon atoms, phenyl or phenyl substituted by nitro, sulpho, carboxy, hydroxy, chloro, methoxy, methyl, dimethylamino or a group of the formula



wherein G has the meanings indicated above.

3,925,349

RADIATION CURABLE NON-GELLED MICHAEL ADDITION REACTION PRODUCTS

Joseph E. Gaske, Mount Prospect, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Division of Ser. No. 290,068, Sept. 18, 1972, Pat. No. 3,844,916. This application Jan. 31, 1974, Ser. No. 438,315

Int. Cl.² C08F *2/48;* **C08L** *63/10*

U.S. Cl. 204—159.15 **7 Claims**

1. An ultraviolet curable composition comprising: (1) a radiation curable liquid, non-gelled Michael additiion reaction product of an aliphatic amine containing a single amino hydrogen atom selected from dibutyl amine and diethyl amine with a stoichiometric excess of polyester of acrylic acid with an epoxy resin, thus providing a Michael addition reaction product in which the amino hydrogen atoms are substantially consumed and containing unreacted acrylate groups, said amine constituting at least 0.5% of said composition; and (2) a photosensitizer rendering the product sensitive to ultraviolet radiation.

3,925,350

PHENYL-AZO-INDOLE COMPOUNDS

Gerhard Wolfrum, Bergisch-Neukirchen; Richard Sommer, Leverkusen, and Erich Klauke, Odenthal-Hahnenberg, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed Jan. 26, 1973, Ser. No. 327,109

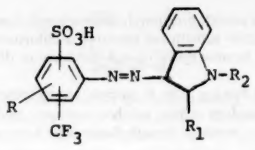
Claims priority, application Germany, Jan. 26, 1972, 2203460.2

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C09B *29/36*

U.S. Cl. 260—165 **1 Claim**

1. Dyestuff of the formula



wherein
R is hydrogen, methyl, methoxy, chloro or bromo;
R_1 is C_1—C_4—alkyl or phenyl;
R_2 is hydrogen, C_1—C_4—alkyl or C_1—C_4—alkyl substituted by cyano, carbonamido, or carboxy.

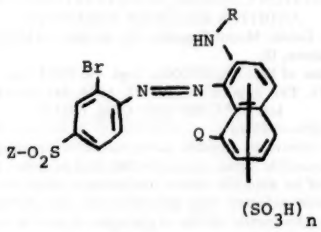
3,925,351

WATER-SOLUBLE REACTIVE MONOAZODYESTUFFS

Fritz Meininger; Ernst Hoyer, both of Frankfurt am Main, and Hermann Fuchs, Kelkheim, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Dec. 18, 1972, Ser. No. 316,251
Claims priority, application Germany, Dec. 21, 1971, 2163389
Int. Cl.² C09B *29/06, 29/30;* **D06P** *1/38, 3/66*
U.S. Cl. 260—196 **6 Claims**

1. Water-soluble azo dyestuff of the formula



wherein R is hydrogen, lower alkyl, cyclohexyl or phenyl, Q is hydrogen, or hydroxy, Z is
$-CH_2-CH_2-OSO_3H$
$-CH=CH_2$ or
$-CH_2-CH_2-OH$
and *n* is 1 or 2.

3,925,352

L-ASPARTATE OF CYCLIC ERYTHROMYCIN A CARBONATE AND PROCESS OF PREPARING THE SAME

Halina Bojarska-Dahlig, and Zdzislaw Szypka, both of Warsaw, Poland, assignors to Instytut Przemysku Farmaceutycznego, Warsaw, Poland

Filed July 29, 1974, Ser. No. 492,916
Claims priority, application Poland, July 28, 1973, 164368
Int. Cl.² C07G *3/00*
U.S. Cl. 260—210 E **1 Claim**

1. L-aspartate of cyclic erythromycin A carbonate.

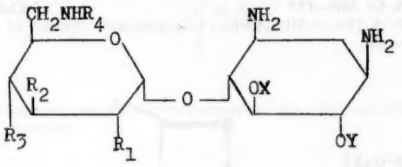
3,925,353

4-0-(6-ALKYLAMINO-6-DEOXY-ALPHA-D-HEXOPYRANOSYL)-DEOXYSTREPTAMINE DERIVATIVES AND THE PRODUCTION THEREOF

Hamao Umezawa; Sumio Umezawa, both of Tokyo, and Osamu Tsuchiya, Yokohama, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Filed Aug. 22, 1973, Ser. No. 390,403
Claims priority, application Japan, Aug. 23, 1972, 47-83671
Int. Cl.² C08B *19/00*
U.S. Cl. 260—210 AB **6 Claims**

1. A compound of the formula:



wherein R_1 is hydroxyl or amino; R_2 and R_3 are both hydrogen or hydroxyl; R_4 is alkyl of 1–4 carbon atoms; X is hydrogen or β-D-ribosyl; and Y is hydrogen or 3-amino-3-deoxy-α-D-glucopyranosyl, and the pharmaceutically acceptable acid-addition salts thereof.

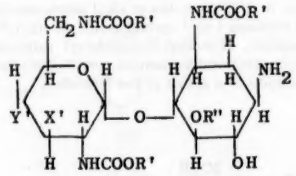
3,925,354

PROCESS FOR THE PRODUCTION OF AN 1-N-(S)-ALPHA- SUBSTITUTED-W-AMINOACYL) DERIVATIVE OF NEAMINE, 3′, 4′-DIDEOXYNEAMINE, RIBOSTAMYCIN OR 3′,4′-DIDEOXYRIBOSTAMYCIN

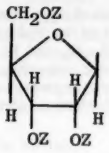
Hamao Umezawa; Sumio Umezawa, both of Tokyo, and Osamu Tsuchiya, Yokohama, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

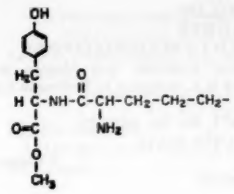
Filed Oct. 1, 1973, Ser. No. 402,086
Claims priority, application Japan, Oct. 6, 1972, 47-99866
Int. Cl.² C07H *1/00*
U.S. Cl. 260—210 AB **18 Claims**

1. A process for preparing an aminoglycosidic antibiotic aminol derivative of the formula

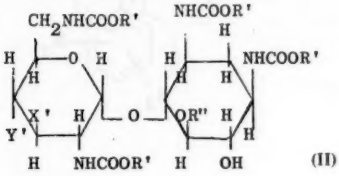


wherein
R′ is alkyl of 1–4 carbon atoms, benzyl, p-nitrobenzyl or phenyl;
R″ is hydrogen, alkanoyl of 1–6 carbon atoms, benzoyl, benzyl, tetrahydropyranyl, methoxycyclohexyl, allyl, isopropylidene, cyclohexylidene, benzylidene or β-D-ribrofuranosyl of the formula



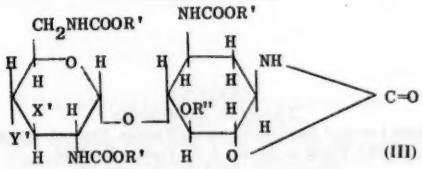


wherein Z
is hydrogen, alkanoyl of 1–6 carbon atoms, benzoyl, benzyl, tetrahydropyranyl, methoxycylohexyl, allyl, isopropylidene, cyclohexylidene or benzylidene; and
X′ and Y′ are both hydrogen, hydroxyl or —OZ′ wherein Z′ is alkanoyl of 1–6 carbon atoms, benzoyl, benzyl, tetrahydropyranyl, methoxycylohexyl, allyl, isopropylidene, cyclohexylidene or benzylidene; which comprises:
a. reacting a compound of the formula



(II)

wherein
R′, R″, X′ and Y′ have the above-indicated values with an alkali metal hydroxide or an alkali metal hydride in a non-aqueous reaction medium to form a cyclic carbamate of the formula



(III)

wherein
R′, R″, X′ and Y′ have the above-indicated values; and
b. partially hydrolyzing said cyclic carbamate in an aqueous reaction medium with a weak base selected from the group consisting of alkali metal carbonates, alkaline earth metal hydroxides and hydrazine to form said aminoglycosidic antibiotic aminol derivatives.

3,925,355

LABELLED DIGOXIN DERIVATIVES FOR RADIOIMMUNOASSAY

Roger N. Piasio, and James E. Woiszwillo, both of Medfield, Mass., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 1, 1974, Ser. No. 447,249
Int. Cl. C07c *173/02*
U.S. Cl. 260—210.5 **5 Claims**

1. A digoxin derivative having the following chemical structure:

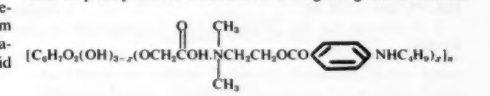
3,925,356

HIGH-MOLECULAR DERIVATIVE OF 2-DIMETHYLAMINOETHYL ESTER OF P-BUTYLAMINOBENZOIC ACID, METHOD FOR PREPARING SAME AND APPLICATION THEREOF

Milda Yanovna Pormale, ulitsa Suvorova 104, kv. 10; Nadezhda Alexandrovna Kashkina, ulitsa Talsu 9/11, kv. 22; Elfrida Indrikovna Veinberg, ulitsa Volguntes, 78, kv. 1a; Arvid Yanovich Kalninsh, ulitsa Sverdlova 8, kv. 3; Janis Shusters, ulitsa Kveles 15, korpus 4, kv. 30; Valdis Danielovich Mikazhans, ulitsa Marupes 17, kv. 35; Indulis Valdovich Purvinsh, ulitsa Marupes, 17, kv. 86a, all of Riga, and Antons Petrovich Skutelis, Tuberkuleznaya bolnitsa "Jugla", korpus 1, kv. 7, Rizhsky raion, Stopinsky S/S, all of U.S.S.R.

Filed May 15, 1973, Ser. No. 360,479
Int. Cl.² C08B *3/00*; **A01N** *9/00*
U.S. Cl. 260—214 **6 Claims**

1. A high-molecular derivative of 2-dimethylaminoethyl ester of p-butylaminobenzoic acid having the general formula



where x is the degree of substitution from 0.6 to 1.5, and n is the degree of polymerization from 30 to 120.

3,925,357

α-SULFOBENZYLPENICILLIN SALT

Hiroaki Okada, Osaka; Hiroshi Fujisawa, Uenohiga; Masahiko Fujita, Osaka; Tsugio Shimamoto, Hyogo, and Hiroaki Nomura, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed June 19, 1973, Ser. No. 371,528
Claims priority, application Japan, July 1, 1972, 47-66301
Int. Cl.² C07D *499/22*
U.S. Cl. 260—239.1 **4 Claims**

1. α-Sulfobenzylpenicillin di-amine salt in which the amine is arginine, lysine or N-methylglucamine.

3,925,358

1-LOWER ALKYL-2-SUBSTITUTED-1,4-BENZODIAZEPINES

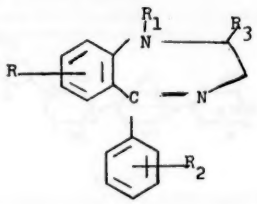
Robert Ye-Fong Ning, West Caldwell, and Morton A. Schwartz, Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed July 27, 1973, Ser. No. 383,228

Int. Cl.[2] C07D *243/16*

U.S. Cl. 260—239 BD **8 Claims**

1. A compound of the formula



wherein R is selected from the group consisting of hydrogen, halogen, lower alkyl, trifluoromethyl, nitro, cyano, lower alkoxy and lower alkylthio; R_1 signifies lower alkyl; R_2 signifies hydrogen or halogen; and R_3 signifies cyano, carboxamido or lower alkoxyimino

and the pharmaceutically acceptable acid addition salts thereof.

3,925,359

NOVEL 2[2-(1,3-DIAZACYCLOALK-2-ENYL)]BENZOPHENONE DERIVATIVES AND NOVEL 1,3-DIAZACYCLOALKENYL[2,1-1]ISOINDOLE DERIVATIVES

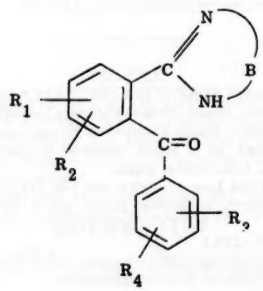
Werner Metlesics, Clifton, and Leo Henryk Sternbach, Upper Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 639,315, May 18, 1967, Pat. No. 3,888,846, which is a continuation-in-part of Ser. No. 626,965, Mar. 30, 1967. This application July 30, 1974, Ser. No. 493,017

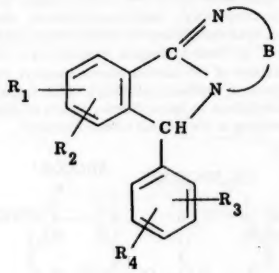
Int. Cl.[2] C07D *243/04*

U.S. Cl. 260—239 BC **1 Claim**

1. A process for the preparation of a compound of the formula:



wherein B represents an alkylene chain of 2 to 4 carbon atoms in which one or more of the hydrogens can be replaced by lower alkyl; and R_1, R_2, R_3, and R_4 are each independently selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, hydroxy and trifluoromethyl and tautomers thereof, which comprises treating a compound of the formula:



wherein B, R_1, R_2, R_3, and R_4 are as defined hereinabove with gaseous oxygen.

3,925,360

2-BENZYL AZIRIDINES

John Lambert Jackson, Henley-on-Thames, England, assignor to John Wyeth & Brother Ltd., Taplow, England

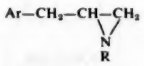
Filed Dec. 5, 1973, Ser. No. 422,031

Claims priority, application United Kingdom, Dec. 21, 1972, 59138/72

Int. Cl.[2] C07D *203/08*

U.S. Cl. 260—239 E **5 Claims**

1. A compound selected from the group consisting of aziridines of the formula



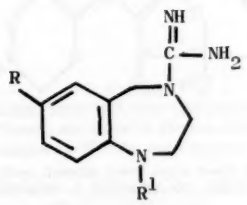
and the pharmaceutically acceptable salts thereof, in which Ar is a member of the group consisting of trifluoromethylphenyl and dichlorophenyl and R is hydrogen or lower alkyl.

3,925,361
2,3,4,5-TETRAHYDRO-1H-1,4-BENZODIAZEPINE-4-CARBOXAMIDINES

Dong H. Kim, Wayne, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Aug. 1, 1974, Ser. No. 493,813
Int. Cl.² C07D *243/14*
U.S. Cl. 260—239 BD 4 Claims

1. A compound of the formula



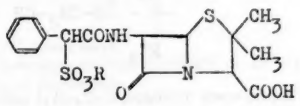
wherein R is hydrogen, chlorine, bromine, fluorine, or iodine; R^1 is hydrogen, methyl, ethyl, or propyl; and the non-toxic, pharmaceutically acceptable acid addition salts thereof.

3,925,362
α-ALKYLSULFOBENZYL PENICILLINS AND PRODUCTION THEREOF

Keiichi Sugimoto, Kawanishi; Kouji Nishijima, and Nobuharu Kakeya, both of Takatsuki, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Apr. 24, 1973, Ser. No. 354,140
Claims priority, application Japan, May 22, 1972, 47-50998
Int. Cl.² C07D *499/44*
U.S. Cl. 260—239.1 6 Claims

1. A penicillin compound selected from the group consisting of compounds of the formula



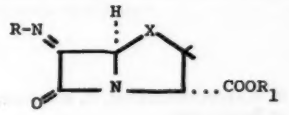
wherein R is a straight chain alkyl group of 7 to 22 carbon atoms, and pharmaceutically acceptable salts thereof.

3,925,363
PROCESS FOR EPIMERIZING PENICILLIN COMPOUNDS, AND RELATED PRODUCTS

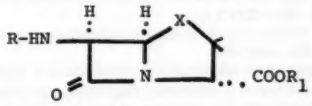
Lovji D. Cama, Edison, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 17, 1974, Ser. No. 434,158
Int. Cl.² C07D *499/44*
U.S. Cl. 260—239.1 7 Claims

1. The process for reducing a 6-acylimino penicillin having the formula



wherein X is O or S, R is a conventional pharmaceutically acceptable acyl group, and R_1 is an easily removable conventional ester blocking group which comprises reacting, in an inert solvent, at a temperature of between about −10°C. to −60°C., the compound above with an active hydride selected from the group consisting of lithium aluminum trialkoxy hydride, sodium borohydride, lithium borohydride, or lithium borohydride cyanide followed by warming the reaction mixture to about 0°C., and recovering the compound:



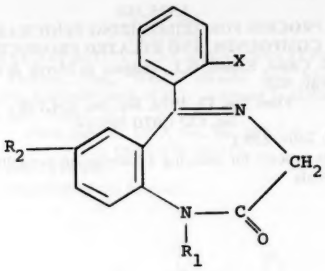
thereby produced.

3,925,364
BENZODIAZEPINE DERIVATIVES

Hisao Yamamoto; Shigeho Inaba, both of Nishinomiya; Tadashi Okamoto, Ashiya; Toshiyuki Hirohashi, Kobe; Kikuo Ishizumi, Minoo; Michihiro Yamamoto, Takarazuka; Isamu Maruyama, Minoo; Kazuo Mori, Kobe, and Tsuyoshi Kobayashi, Minoo, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Division of Ser. No. 762,341, Sept. 16, 1968, Pat. No. 3,828,027. This application Aug. 13, 1973, Ser. No. 387,713
Claims priority, application Japan, Oct. 9, 1967, 42-65104; Oct. 18, 1967, 42-67354; Nov. 2, 1967, 42-70794; Nov. 2, 1967, 42-70796; Nov. 2, 1967, 42-70798; Nov. 6, 1967, 42-71598; Nov. 8, 1967, 42-72078; Dec. 9, 1967, 42-79166; Dec. 15, 1967, 42-80514; Dec. 21, 1967, 42-82273; Jan. 10, 1968, 43-1501; Sept. 22, 1967, 42-60952; Sept. 27, 1967, 42-62424; Sept. 27, 1967, 42-62425; Sept. 27, 1967, 42-62426; Sept. 27, 1967, 42-62427; Sept. 27, 1967, 42-62428; Sept. 27, 1967, 42-62429; Sept. 27, 1967, 42-62430; Oct. 9, 1967, 42-65102
Int. Cl.² C07D *243/24*, *243/36*
U.S. Cl. 260—239.3 D 3 Claims

1. A compound of the formula



wherein R_1 is cyclopropylmethyl, R_2 is chlorine and X is a chlorine or fluorine atom.

3,925,365

METHOD FOR ISOLATING EPSILON-CAPROLACTAM MATERIAL

Nobuo Izawa, and Toshihiko Kohno, both of Sakai, Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Filed Feb. 11, 1974, Ser. No. 441,061

Int. Cl.² C07D *201/12, 201/16;* **C08G** *69/14*

U.S. Cl. 260—239.3 A **17 Claims**

1. A method for purifying an ϵ-caprolactam material comprising the steps of:

bringing an ϵ-caprolactam material selected from the group consisting of a monomer, oligomers, and polymers of ϵ-caprolactam and mixtures of two or more of the above-mentioned compounds and containing at least one impurity compound selected from the group consisting of phosphoric acid and ionized metal compounds, at a temperature of at least 60°C, into contact with an aqueous solution containing 15 to 75 percent by weight of at least one alkali metal phosphate to extract said impurity compound from said ϵ-caprolactam material into said alkali metal phosphate aqueous solution, and

separating said ϵ-caprolactam material phase from said alkali metal phosphate aqueous solution phase.

3,925,366

1,3-OXAZINO(5,6-C)RIFAMYCINS AND METHOD FOR PREPARING THE SAME

Leonardo Marsili, and Carmine Pasqualucci, both of Milan, Italy, assignors to Archivar Industrie Chimiche del Trentino S.p.A., Rovereto, Italy

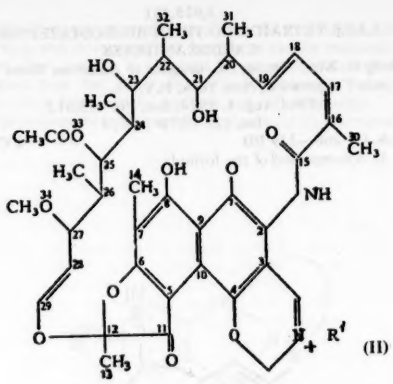
Filed May 23, 1974, Ser. No. 472,886

Claims priority, application Italy, July 25, 1973, 27066/73; Jan. 24, 1974, 19774/74

Int. Cl.² C07D *498/22*

U.S. Cl. 260—239.3 P **7 Claims**

1. 1,3-oxazino(5,6-c)rifamycin compounds, characterized by the formula



(II)

wherein R^1 is lower alkyl, lower alkenyl, cycloalkyl having 5 to 6 carbon atoms, phenyl, benzyl, α- or β-phenethyl.

3,925,367

PYRAZOLINE BRIGHTENERS

Gunther Boehmke, and Hans Theidel, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed Oct. 15, 1971, Ser. No. 189,772

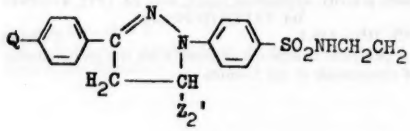
Claims priority, application Germany, Oct. 15, 1970, 2050725

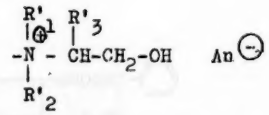
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C07D *231/06*

U.S. Cl. 260—239.65 **4 Claims**

1. Pyrazoline compound of the formula





in which

R'_1 and R'_2 represent hydrogen; C_1-C_4-alkyl radicals which are optionally substituted by chlorine, hydroxyl, nitrile, C_1-C_4-alkoxy, phenoxy or C_2-C_5-alkylcarbonyl groups; cyclohexyl or benzyl radicals, or together with the N atom form a pyrrolidine, piperidine, imidazole or morpholine ring,

R'_3 denotes hydrogen or C_1-C_4-alkyl radicals which are optionally substituted by chlorine, hydroxyl or C_1-C_4-alkoxy groups,

Z'$_2$ represents hydrogen or C_1-C_4-alkyl radicals and Q represents hydrogen or chlorine.

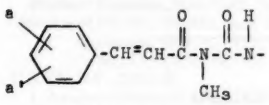
3,925,368

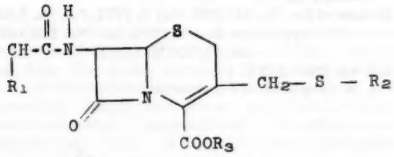
ACYLUREIDO SUBSTITUTED CEPHALOSPORINS

Robin D. G. Cooper, and David K. Herron, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 1, 1974, Ser. No. 456,517
Int. Cl.² C07D *501/36*
U.S. Cl. 260—240 J **5 Claims**

1. The compound of the formula



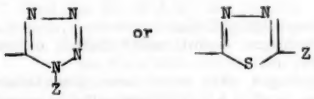


wherein

a and *a'* are independently hydrogen, halogen or nitro;

R_1 is phenyl, monohydroxyphenyl, mono- or dihalophenyl, monohydroxy substituted mono- or dihalophenyl, thienyl or furyl;

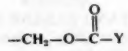
R_2 is



wherein

Z is C_1–C_4 lower alkyl;

R_3 is hydrogen, indanyl, phthalidyl or an acyloxymethyl group of the formula



wherein

Y is C_1–C_4 alkyl or phenyl; and when

R_3 is hydrogen, the pharmaceutically acceptable, nontoxic salts thereof.

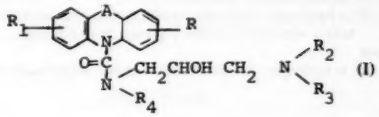
3,925,369

NEW TRICYCLIC UREAS PROCESSES FOR THEIR PRODUCTION AND PHARMACEUTICAL COMPOSITIONS

Michel Vincent, Bagneux; Georges Remond, Versailles, and Michel Laubie, Vaucresson, all of France, assignors to Science Union et Cie, Societe Francaise de Recherche Medicale, Suresnes, France

Filed Oct. 31, 1973, Ser. No. 411,540
Claims priority, application United Kingdom, Nov. 3, 1972, 50697/72
Int. Cl.² C07D *279/36, 223/22, 223/24*
U.S. Cl. 260—243 A **9 Claims**

1. A compound selected from the group consisting of a Tricyclic ureas of formula I



wherein

A is $—CH_2—CH_2—$, $—CH=CH—$ or $—S—$

R and R_1 which may be the same or different, are each hydrogen, halogen, lower alkoxy, trifluoromethyl, lower alkylthio or trifluoromethoxy,

R_4 is hydrogen, lower alkyl or monosubstituted lower alkyl,

R_2 is hydrogen, lower alkyl, lower alkenyl, phenyl lower alkyl or phenyl monosubstituted lower alkyl,

R_3 is lower alkyl, monosubstituted lower alkyl, lower alkenyl, lower alkynyl, phenyl lower alkyl or phenyl monosubstituted lower alkyl,

or where R_2 and R_3 are joined together there is provided a heterocycle selected from the group consisting of pyrollidine, piperidine, aziridine, hexamethyleneimine, oxazolidine, morpholine, thiazolidine, thiamorpholine, piperazine and homomorpholine,

said heterocycle being substituted by from 0 to 2 lower alkyl moieties,

wherein: the lower alkyl moiety is a branched or straight chain hydrocarbyl moiety of 1-6 carbon atoms,

the lower alkenyl moiety is a branched or straight chain hydrocarbyl residue of one or more double bonds and having 2-10 carbon atoms,

the lower alkynyl moiety is a hydrocarbon residue of 2-6 carbon atoms having one triple bond,

the substituents on the substituted-lower alkyl moiety are hydroxy, lower alkoxy and di-lower alkyl amino, wherein said lower alkoxy and lower alkyl moieties contain 1-6 carbon atoms,

the substituents on said substituted phenyl moiety are selected from the group consisting of methoxy, trifluoromethyl, halogen, lower alkyl, and lower alkythio,

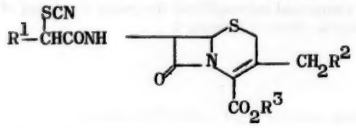
b. the physiologically tolerable acid addition thereof with a mineral or organic acid.

3,925,370
2-THIOCYANATOALKYL AND ARALKYLCARBOXAMIDO CEPHALOSPORANIC AND PENICILLANIC ACID DERIVATIVES

Peter H. L. Wei, Springfield, and Ronald J. McCaully, Malvern, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Mar. 18, 1974, Ser. No. 452,085
Int. Cl.² C07D 501/28, 499/62; A61K 31/545, 31/43
U.S. Cl. 260—243 C 4 Claims

1. A compound of the formula:



in which

R^1 is hydrogen or phenyl;

R^2 is hydrogen, alkanoyloxy of 2 to 6 carbon atoms or, when taken with the 3-carboxy group, N-pyridinium;

and

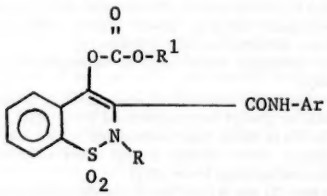
R^3 is hydrogen, an alkali metal or the ammonium ion.

3,925,371
BENZOTHIAZINE-1,1-DIOXIDES

Chris Royce Rasmussen, Ambler, Pa., assignor to McNeil Laboratories, Incorporated, Ft. Washington, Pa.

Filed Sept. 23, 1974, Ser. No. 508,116
Int. Cl.² C07D 279/02
U.S. Cl. 260—243 R 2 Claims

1. A compound represented by the formula



wherein

R is lower alkyl;

R^1 is selected from the group consisting of lower alkyl, phenyl and benzyl; and

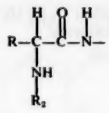
Ar is a heteroaryl radical selected from the group consisting of 2-thiazolyl, 3isoxazolyl and mono- and di-methyl substituted 2-thiazolyl and 3-isoxazolyl.

3,925,372
ALPHA-AMINOACYL-3-HALO CEPHALOSPORINS

Robert R. Chauvette, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 335,381, Feb. 23, 1973, abandoned. This application Apr. 1, 1974, Ser. No. 457,153
Int. Cl.² C07D 501/20
U.S. Cl. 260—243 C 10 Claims

1. A compound of the formula

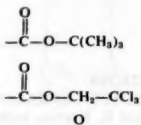


wherein

R is phenyl, hydroxyphenyl, halophenyl, methylphenyl, methoxyphenyl, 2-thienyl, 3-thienyl or 2-furyl;

R_1 is hydrogen, benzyl, p-methoxybenzyl, p-nitrobenzyl, diphenylmethyl, 2,2,2-trichloroethyl, trimethylsilyl, or t-butyl;

R_2 is hydrogen,



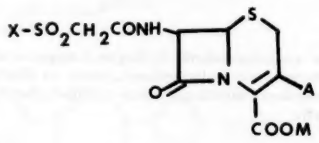
X is fluoro, chloro, bromo or iodo; and the pharmaceutically acceptable, non-toxic salts thereof.

3,925,373
SUBSTITUTED SULFONYLACETAMIDO CEPHALOSPORINS

Robert M. De Marinis, King of Prussia, and John R. E. Hoover, Glenside, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 249,858, May 3, 1972, Pat. No. 3,865,819. This application Dec. 3, 1974, Ser. No. 529,168
Int. Cl.² C07D 501/28
U.S. Cl. 260—243 C 8 Claims

1. A compound of the structure:



where:

X is lower alkyl of C_1–C_6;

A is hydrogen, methyl, acetoxymethyl, or pyridiniummethyl; and

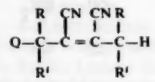
M is hydrogen, alkali, metal cation, nontoxic ammonium cation, or when A is pyridiniummethyl an anionic charge.

3,925,374
AMINODICYANO ALKENE COMPOUNDS

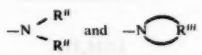
Van C. Vives, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 11, 1974, Ser. No. 460,044
Int. Cl.² C07C 121/45; C07D 211/34, 295/14
U.S. Cl. 260—247 20 Claims

1. An aminodicyano alkene of the formula



having from 8 to 26 carbon atoms per molecule, wherein each R is individually selected from the group consisting of hydrogen, alkyl having from 1 to 4 carbon atoms and cycloalkyl having from 3 to 6 carbon atoms, each R^1 is individually selected from the group consisting of R and aryl having from 6 to 10 carbon atoms, and Q is selected from the group consisting of



wherein each R'' is individually selected from the group consisting of alkyl radicals having from 1 to 10 carbon atoms and R''' is selected from the group consisting of alkylene and oxydialkylene radicals having from 4 to 6 carbon atoms.

3,925,375
SULFOSUCCINATE DERIVATIVES AS DETERGENT BUILDERS

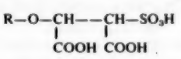
Vincent Lamberti, Upper Saddle River, N.J., assignor to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 156,933, June 25, 1971, abandoned. This application Sept. 5, 1973, Ser. No. 394,613

Int. Cl.² C07D *295/00*; **C07C** *143/00*

U.S. Cl. 260—247.1 E **7 Claims**

1. An α-substituted-β-sulfosuccinic acid having the general formula:



and the alkali metal, ammonium, or substituted ammonium salt forms thereof wherein the substituted ammonium salts are selected from the group consisting of monoethanolammonium, diethanolammonium, triethanolammonium, methylammonium, dimethylammonium, trimethylammonium, tetramethylammonium, morpholinium, N-methyl-monoethanolammonium and N-ethylmonoethanolammonium, wherein R is an alkyl group containing 1–30 carbon atoms.

3,925,376
PIPERIDINE DERIVATIVES

Alexander Michael Chalmers, Cheadle Hulme; James Jack, Bramhall, and Barry Cook, Manchester, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

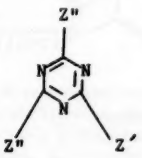
Filed Apr. 11, 1973, Ser. No. 350,296

Claims priority, application United Kingdom, Apr. 21, 1972, 18558/72; Feb. 3, 1973, 5469/73

Int. Cl.² C07D *251/26*

U.S. Cl. 260—248 CS **11 Claims**

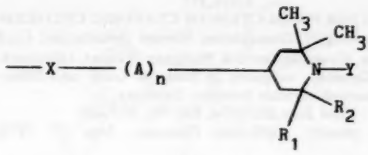
1. A compound of the formula



I

and salts thereof,

Z' is a group having the formula:

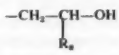


II

wherein R_1 and R_2 are the same or different and each is a straight or branched alkyl of 1 to 12 carbon atoms or R_1 and R_2 form together with the ring carbon atom to which they are bound, a cycloalkyl group having from 5 to 12 carbon atoms;

X is —O—, —S— or —N—, wherein

wherein R_7 is hydrogen, a straight- or branched alkyl of 1 to 20 carbon atoms or benzyl; Y is 0', hydrogen, a straight- or branched alkyl of 1 to 20 carbon atoms, an alkenyl or alkynyl of 3 to 12 carbon atoms, an aralkyl having from 7 to 11 carbon atoms or the group



wherein R_8 is hydrogen, methyl or phenyl; n is 0 or 1; and A is —CH_2—, or the group

wherein R_9 is a hydrogen or alkyl of 1 to 20 carbon atoms; Z'' and Z''' are the same
or different and each is a piperidine group of formula II as hereinbefore defined, a halogen atom, a substituted amino group having the formula:

III

wherein R_3 and R_4 are the same of different and each is hydrogen a straight or branched alkyl of 1 to 20 carbon atoms, a cycloalkyl of 5 to 12 carbon atoms, an aryl which is unsubstituted or substituted with one or more alkyl groups and having a total of from 6 to 18 carbon atoms or an aralkyl having from 7 to 12 carbon atoms, or R_3 and R_4 together with the nitrogen atom to which they are bound, form a nitrogen containing ring having 5 to 7 ring atoms; or Z'' and Z''' are a hydroxy or an ether group having the formula:

$$—OR_5 \qquad \text{IV}$$

wherein R_5 is hydrogen, a straight or brached chain alkyl of 1 to 20 carbon atoms, a cycloalkyl of 5 to 12 carbon atoms, an aryl which is unsubstituted or substituted by one or more alkyl groups and having a total of 6 to 18 carbon atoms, or an aralkyl having from 7 to 12 carbon atoms;
or Z'' and Z''' are a thiol or thio ether group having the formula:

$$—SR_6 \qquad \text{V}$$

wherein R_6 is hyrogen, a straight or branched alkyl of 1 to 20 carbon atoms or a cycloalkyl of 5 to 12 carbon atoms.

3,925,377

PROCESS FOR PRODUCTION OF CYANURIC CHLORIDE

Friedhelm Geiger, Grossauheim; Werner Heimberger; Gerd Schreyer, Grossauheim, and Wolfgang Weigert, Offenbach, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Filed June 26, 1974, Ser. No. 483,454

Claims priority, application Germany, June 27, 1973, 2332636

Int. Cl.² C07D *251/28*

U.S. Cl. 260—248 C 9 Claims

1. A process for the recovery of liquid cyanuric chloride from a mixture formed by the trimerization of cyanogen chloride in a trimerization reactor with subsequent fractionation of said mixture comprising conducting the mixture in an at least partially gaseous condition at 146° to 500°C. to a column system, bringing said mixture in a first fractionating column into contact with a solvent for cyanuric chloride having a boiling point between that of cyanogen chloride and that of cyanuric chloride and which is stable to cyanuric chloride, cyanogen chloride, chlorine and hydrogen chloride, recovering condensed liquid cyanuric chloride from the bottom of said first column at a temperature above the boiling point of said solvent, removing distillate mixture containing solvent, cyanogen chloride, chlorine and any carbon dioxide, nitrogen and hydrogen chloride from the top of said first column, partially condensing a portion of said distillate and returning said partial condensate to the top of the first fractionating column, leading the solvent containing residual gas of chlorine, cyanogen chloride and any carbon dioxide, nitrogen and hydrogen chloride present to a second fractionating column adding sufficient liquid cyanogen chloride to the top of said second column to maintain a reflux in the top of said second column, removing a mixture of chlorine and cyanogen chloride and any carbon dioxide, nitrogen and hydrogen chloride free of said solvent from the top of said second column, returning the chlorine and cyanogen chloride to the trimerization reactor, insuring that the gas entering said reactor contains at least 50 weight percent cyanogen chloride, collecting chlorine and cyanogen chloride free solvent in the bottom of the second column and returning it to the top of the first fractionating column.

3,925,378

TETRAALKYL PYRAZINES FROM ALKANOLAMINES BY COPPER-CHROMITE CATALYSIS

Heinz-Werner Voges, and Josef Ewers, both of Dorsten, Germany, assignors to Veba-Chemie AG, Gelsenkirchen-Buer, Germany

Filed Aug. 11, 1972, Ser. No. 280,015

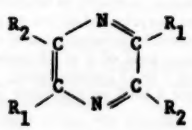
Claims priority, application Germany, Aug. 13, 1971, 2140649

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

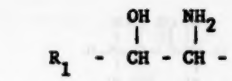
Int. Cl.² C07D *241/12*

U.S. Cl. 260—250 B 4 Claims

1. Process for preparing 2,3,5,6-tetraalkylpyrazines having the formula



which comprises the step of cyclization by dehydrogenation and dehydration of 1,2-dialkylmonoethanolamines having the formula



wherein R_1 and R_2 represent identical or different C_{1-4} alkyl radicals on copper-chromate catalyst at temperatures of 200° to 300° C, in the presence of 1 to 20 moles of ammonia per mole of 1,2-dialkylmonoethanolamine and in the presence of 0.1 to 20 moles of water vapor per mole of 1,2-dialkylmonoethanolamine; said catalyst consisting essentially of 5–50 wt/% copper, and 1–10 wt/% chromium and aluminum oxide and/or silicon dioxide support.

3,925,379

N-(SUBSTITUTED PHENYL)-2,3-DIAZABICYCLO[2.2.2]OCT-5-ENE AND [2,2.1]HEPT-5-ENE,2,3-DICARBOXIMIDES

Brigitta von Bredow, Binningen, and Hans U. Brechbühler, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

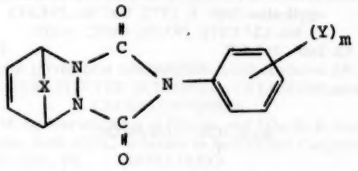
Filed Aug. 22, 1973, Ser. No. 390,648

Claims priority, application Switzerland, Sept. 1, 1972, 12920/72; Aug. 3, 1973, 11302/73

Int. Cl.² C07D *237/26*

U.S. Cl. 260—250 AC 11 Claims

1. A compound of the formula



wherein X represents $—CH_2—$ or $—CH_2—CH_2—$, Y represents chlorine, or trifluoromethyl, and *m* is a number from 1 to 3 with the proviso that only one Y is trifluoromethyl.

3,925,380

QUINOXALINYLTHIOALLOPHANATE FUNGICIDES

John Benjamin Adams, Jr., Hockessin, and Gregory Wayne Schwing, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

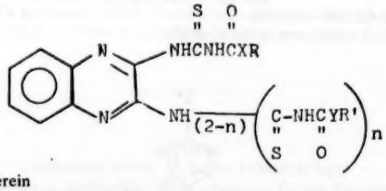
Filed Aug. 13, 1973, Ser. No. 387,790

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C07D *241/40*

U.S. Cl. 260—250 Q 3 Claims

1. A compound of the formula



wherein

X is oxygen or sulfur;

Y is oxygen or sulfur;

n is 0 or 1;

R is alkyl of 1 to 4 carbon atoms, allyl or methoxyethyl, and

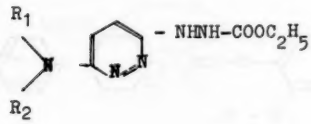
R′ is alkyl of 1 to 4 carbon atoms, allyl or methoxyethyl.

3,925,381
6-SUBSTITUTED 3-CARBETHOXYHYDRAZINOPYRIDAZINE

Carlo Carpi, Reggio Emilia; Luciano Dorigotti, and Giorgio Pifferi, both of Milan, all of Italy, assignors to I.S.F. S.p.A., Milan, Italy

Filed Mar. 4, 1974, Ser. No. 447,523
Claims priority, application Italy, Mar. 7, 1973, 21297/73
Int. Cl.² C07D *237/20*
U.S. Cl. 260—250 A **6 Claims**

1. A compound of the formula:



(I)

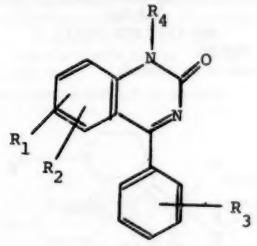
wherein R_1 and R_2 which may be the same or different, represent alkyl having from 1 to 6 carbon atoms, allyl, 2-hydroxyethyl or 2-hydroxypropyl and their pharmaceutically acceptable salts.

3,925,382
PROCESS FOR PREPARING QUINAZOLINE DERIVATIVES

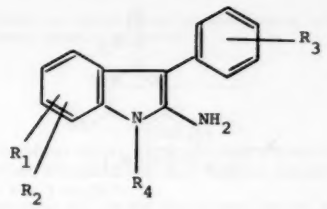
Kikuo Ishizumi, Osaka; Kazuo Mori, Hyogo; Michihiro Yamamoto, Hyogo; Masao Koshiba, Hyogo; Shigeho Inaba, Hyogo, and Hisao Yamamoto, Hyogo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 23, 1973, Ser. No. 344,400
Claims priority, application Japan, Mar. 24, 1972, 47-29984
Int. Cl.² C07D *239/82*
U.S. Cl. 260—251 QB **7 Claims**

1. A process for preparing a quinazolinone derivative represented by the formula



wherein R_1, R_2 and R_3 each represents a hydrogen atom, a halogen atom, trifluoromethyl, nitro, lower alkyl or lower alkoxy; and R_4 represents a hydrogen atom, benzyl, lower alkyl, 2,2,2-trifluoroethyl, 2,2,3,3,3-pentafluoropropyl or (C_{3-6} cycloalkyl)C_{1-2} alkyl, which comprises the step of reacting an aminoindole derivative represented by the formula



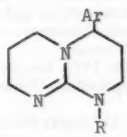
wherein R_1, R_2, R_3 and R_4 are as defined above, with an oxidizing agent selected from the group consisting of ozone and potassium hydroxide-bromine in the presence of an inert solvent.

3,925,383
BICYCLIC IMIDAZOLES AND PYRIMIDINES

Josephus Ludovicus Hubertus Van Gelder; Alfons Herman Margaretha Raeymaekers, both of Beerse; Leopold Frans Corneel Roevens, Rijkevorsel, and Willey Joannes Van Laerhoven, Ravels, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Division of Ser. No. 313,285, Dec. 8, 1972, Pat. No. 3,865,836. This application Aug. 13, 1974, Ser. No. 499,743
Int. Cl.² C07D *239/00*
U.S. Cl. 260—256.4 F **2 Claims**

1. A member selected from the group of compounds having the formula:



and the therapeutically active acid addition salts thereof, wherein:

R is a member selected from the group consisting of hydrogen and benzyl; and

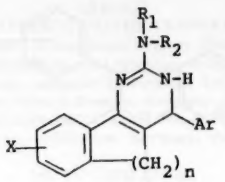
Ar is a member selected from the group consisting of phenyl, loweralkylphenyl, halophenyl and di-halophenyl.

3,925,384
2-AMINO-4,5-DIHYDRO-4-ARYLINDENO PYRIMIDINES

John Krapcho, Somerset, and Chester Frank Turk, Kendall Park, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Oct. 21, 1974, Ser. No. 516,306
Int. Cl.² C07D *239/70*
U.S. Cl. 260—256.4 Q **9 Claims**

1. A compound of the formula:



wherein X is selected from the group consisting of hydrogen, alkyl of 1 to 3 carbons, alkoxy of 1 to 3 carbons, halogen, and trifluoromethyl; *n* is 1, 2 or 3; Ar is selected from the group consisting of X-monosubstituted phenyl wherein X is as defined above, pyridyl, and thienyl; and R_1 and R_2 are independently selected from the group consisting of hydrogen and straight or branched chain alkyl of 1 to 4 carbons provided that wherein R_1 and R_2 are both alkyl, the alkyl chains are straight of 1 to 4 carbons; and the pharmaceutically acceptable acid-addition salts and N-oxides thereof.

3,925,385

6-CARBETHOXY-3,7-DISUBSTITUTEDPYRAZOLO[1-,5A]PYRIMIDINES

Darrell E. O'Brien, Mission Viejo; Roland K. Robins, and Robert H. Springer, both of Santa Ana, all of Calif., assignors to ICN Pharmaceuticals, Inc., Irvine, Calif.

Filed Apr. 20, 1972, Ser. No. 245,870

Int. Cl.² C07D *487/04*

U.S. Cl. 260—256.4 F **3 Claims**

1.

6-Carbethoxy-7-ethylamino-pyrazolo[1,5a]pyrimidine.

3,925,386

6-HYDROXY-DIHYDRO-URACILS, PROCESS FOR THEIR PREPARATION

Gerhard Jager, Wuppertal-Elberfeld; Hans Jurgen Wenzelburger, Wuppertal-Cronenberg, and Robert R. Schmidt, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

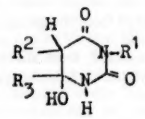
Filed June 28, 1972, Ser. No. 266,872

Claims priority, application Germany, July 1, 1971, 2132763

Int. Cl.² C07D *239/04*

U.S. Cl. 260—260 **26 Claims**

1. 6-Hydroxy-dihydro-uracil compound of the formula



wherein

R^1 is alkyl of from 1 to 13 carbon atoms, cyclohexylmethyl, cyclohexylidene-methyl, alkenyl of from 2 to 4 carbon atoms, haloalkyl of from 1 to 6 carbon atoms, cyanoalkyl of from 1 to 3 carbon atoms, alkoxycarbonylalkyl of from 2 to 3 carbon atoms, cycloalkyl of from 5 to 8 carbon atoms, methylcyclohexyl, plenyl, phenyl substituted with from one to three of methyl, halogen, halomethyl, methoxy and methylthio; naphthyl; phenylalkyl of from 1 to 2 carbon atoms in the alkyl moiety; or phenylcarbonyl;

R^2 is hydrogen or alkyl of from 1 to 2 carbon atoms;

R^3 is alkyl of from 1 to 3 carbon atoms; and

R^2 and R^3 taken together may be an alkylene bridge having 3 carbon atoms and forming a fused ring, which ring may be methyl substituted once or twice.

3,925,387

1-[γ-O-AMINO-P-HALOPHENYL-OXY, THIO OR SULFINYL)-PROPYL]-4-(ALKOXY OR HALO PHENYL)PIPERAZINES

Isamu Maruyama, Minoo; Masaru Nakao; Kikuo Sasajima, both of Toyonaka; Keiichi Ono, Osaka; Masaharu Takayama, Minoo; Shigenari Katayama; Yoshihiro Tanaka, both of Takarazuka; Izumi Yanagihara, Osaka; Shigeho Inaba, Takarazuka, and Hisao Yamamoto, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

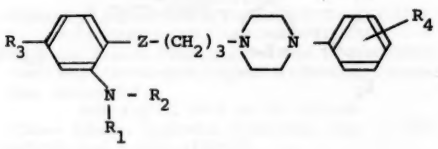
Filed Dec. 4, 1972, Ser. No. 312,106

Claims priority, application Japan, Dec. 3, 1971, 46-97939

Int. Cl.² C07D *295/12*

U.S. Cl. 260—268 PH **6 Claims**

1. A compound of the formula



wherein R_1 is hydrogen, R_2 is hydrogen or C_1–C_7 alkanoyl, R_3 is halogen, Z is oxygen, sulphur or sulfinyl, R_4 is C_1–C_7 alkoxy or halogen, and pharmaceutically acceptable salts thereof.

3,925,388

4-PIPERAZINO-[3,4-B]PYRIDINE-5-CARBOXYLIC ACIDS AND ESTERS

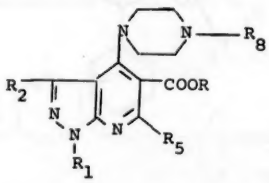
Hans Hoehn, Tegernheim, and Theodor Denzel, Regensburg, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 169,536, Aug. 5, 1971, Pat. No. 3,755,340, which is a continuation-in-part of Ser. No. 41,568, May 28, 1970, abandoned. This application June 11, 1973, Ser. No. 368,561

Int. Cl.² C07D *295/12*

U.S. Cl. 260—268 BC **10 Claims**

1. A compound of the formula



wherein R is hydrogen or alkyl up to 12 carbon atoms; R_1 is hydrogen, lower alkyl, phenyl or phenyl-lower alkyl; R_2 is hydrogen, phenyl or lower alkyl, R_5 is hydrogen, lower alkyl, phenyl or phenyl-lower alkyl and R_8 is hydrogen, lower alkyl or hydroxy-lower alkyl, or physiologically acceptable acid addition salts thereof.

3,925,389

PREPARATION OF AMINOETHYLPIPERAZINES

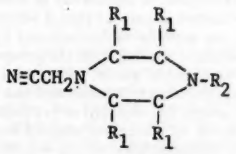
Ernest Leon Yeakey, and Thomas Howard Austin, both of Austin, Tex., assignors to Jefferson Chemical Company, Inc., Houston, Tex.

Filed Nov. 15, 1973, Ser. No. 416,181

Int. Cl.² C07D 295/12

U.S. Cl. 260—268 SY 6 Claims

1. A direct continuous process for preparing a 2-aminoethylpiperazine compound from a cyanomethylpiperazine compound of the formula:



wherein R_1 is selected from a group consisting of hydrogen, alkyl of from 1–12 carbon atoms, and phenyl, and R_2 is selected from a group consisting of hydrogen and cyanomethyl comprising the steps of:

continuously hydrogenating said cyanomethylpiperazine compound in the presence of a pelleted hydrogenation catalyst consisting essentially of cobalt, copper and chromium metal oxides having about 50% to 80% cobalt, about 10% to 49% copper, and about 1% to 10% chromium, based on the total weight of said metals, at a temperature within the range of about 80°C to about 150°C and a pressure within the range of about 1,000 psig to 10,000 psig; and,

recovering the 2-aminoethylpiperazine from the resulting reaction product.

3,925,390

TRIAZOYL-NAPHTHALIMIDE BRIGHTENING AGENTS

Alfons Dorlars, Leverkusen, and Carl-Wolfgang Schellhammer, Opladen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen Bayerwerk, Germany

Continuation of Ser. No. 704,524, Feb. 12, 1968, abandoned. This application Jan. 8, 1973, Ser. No. 322,182

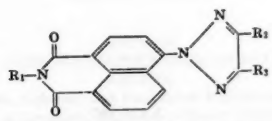
Claims priority, application Germany, Feb. 21, 1967, 51581

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C07D 221/14, 249/06

U.S. Cl. 260—281 NH 11 Claims

1. Triazolyl-naphthalimide of the formula



wherein R_1 is hydrogen, unsubstituted alkyl with 1-12 carbon atoms, β-acetoxyethyl, β-hydroxyethyl, β-propionoxyethyl, 3-dimethyl aminopropyl, cyanomethyl, β-butoxyethyl, 3-trimethylammonium propyl, cyclohexyl, methylcyclohexyl or benzyl;

R_2 and R_3 denote independently of one another hydrogen, unsubstituted alkyl with 1–12 carbon atoms, cyclohexyl, phenyl or phenyl mono or disubstituted with fluoro, chloro, methoxy or methyl.

3,925,391

2-AMINOALKYL TETRAHYDROQUINOLINES

Hugh Colin Richards, Canterbury, England, assignor to Pfizer Inc., New York, N.Y.

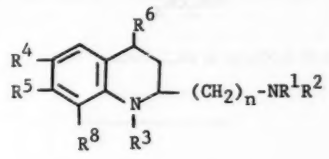
Division of Ser. No. 139,955, May 3, 1971, Pat. No. 3,821,228, which is a continuation-in-part of Ser. No. 732,850, May 29, 1968, abandoned. This application Mar. 18, 1974, Ser. No. 451,979

Claims priority, application United Kingdom, June 10, 1967, 26893/67

Int. Cl.² C07D 215/48

U.S. Cl. 260—288 R 7 Claims

1. A compound of the formula:



and the pharmaceutically acceptable mono-acid addition salts thereof, wherein R^1 and R^2, when taken separately, are each selected from the group consisting of hydrogen, alkyl having from 1 to 5 carbon atoms, β-hydroxyethyl and cycloalkyl having from 3 to 6 carbon atoms; R^1 and R^2, when taken together, complete a ring selected from the group consisting of pyrrolidino, piperidino and morpholino; R^3 is selected from the group consisting of hydrogen, methyl and ethyl; R^4 is methyl; R^5 is selected from the group consisting of nitro, cyano, fluorine, chlorine and bromine, R^6 is hydrogen or methyl; R^8 is hydrogen or methyl, and n is 1 or 2, and the N-oxides of said base compounds wherein R^1 and R^2, when taken separately, are each other than hydrogen.

3,925,392

PROCESS FOR PREPARING VINCAMINE AND ITS STEREOISOMERS

Henry Najer, and Yves Robert Alain Pascal, both of Paris, France, assignors to Synthelabo, Paris, France

Filed Dec. 12, 1973, Ser. No. 423,901

Claims priority, application France, Dec. 15, 1972, 72.44673

Int. Cl.² C07D 471/06

U.S. Cl. 260—293.53 11 Claims

1. A process for the preparation of vincamine, epivincamine or stereoisomer thereof which comprises (I) treating vincaminol or stereoisomer thereof to oxidizing dehydration to yield apovincaldehyde or stereoisomer, thereof; (II) esterifying said apovincaldehyde or stereoisomer thereof into apovincamine or stereoisomer, thereof; (III) hydrogenating said apovincamine or stereoisomer thereof to yield a mixture of 16-methoxycarbonyleburnane stereoisomers, (IV)A treating said mixture with a base to yield the carbanion thereof and treating said carbanion with molecular oxygen whereby there is produced a 16-hydroxy derivative, or (IV)B saponifying the 16-methoxycarbonyl-eburnane stereoisomers to yield 16-carboxy-eburnanes, treating said 16-carboxy-eburnanes with a strong base to yield a carbanion, treating said carbanion with molecular oxygen to yield said 16-hydroxy derivative; and esterifying said 16-hydroxy derivative to yield vincamine, 16-epivincamine stereoisomers thereof.

3,925,393

NOVEL SALTS OF VINCANOL

Simone Heurtaux, Allee Dunand, and Germain Costerousse, Vernouillet, both of France, assignors to Roussel Uclaf, Paris, France

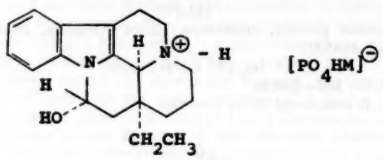
Filed July 9, 1973, Ser. No. 377,503

Claims priority, application France, July 13, 1972, 72.25495

Int. Cl.[2] C07D *371/22*

U.S. Cl. 260—293.53 2 Claims

1. A racemic or optically active mixed alkali metal or ammonium phosphate salt of Vincanol of the formula:



wherein M is NH_4 or an alkali metal.

3,925,394

PHENOXYACETIC ACID DERIVATIVES

Johann Dahm; Joachim Borck; Herbert Nowak; Zdenek Simane, and Detlev Kayser, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

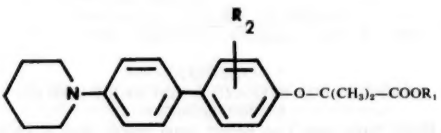
Division of Ser. No. 234,343, March 13, 1972, Pat. No. 3,804,839. This application Sept. 4, 1973, Ser. No. 393,936

Claims priority, application Germany, Mar. 15, 1971, 2112272

Int. Cl.[2] C07D *295/10*

U.S. Cl. 260—293.83 8 Claims

1. A compound of the formula



wherein R_1 is H or alkyl of 1–10 carbon atoms; R_2 is H, alkyl of 1–4 carbon atoms or halogen.

3,925,395

4-ARYL-6-AMINO-3,4-DIHYDROPYRID-2-ONE-3,5-DICARBOXYLIC ACID ESTER

Horst Meyer; Friedrich Bossert, both of Wuppertal; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

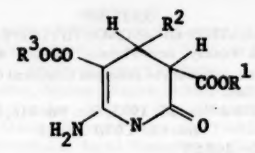
Filed Aug. 21, 1973, Ser. No. 390,193

Claims priority, application Germany, Aug. 31, 1972, 2242787

Int. Cl.[2] C07D *213/55*

U.S. Cl. 260—294.8 G 18 Claims

1. A compound of the formula:



wherein

R^2 is (a) unsubstituted phenyl, (b) phenyl which is monosubstituted by cyano, or carbalkoxy in which alkoxy has from 1 to 4 carbon atoms, (c) phenyl which is monosubstituted by one member or disubstituted by two like or different members selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogeno, nitro, trifluoromethyl and alkylthio of 1 to 4 carbon atoms, (d) naphthyl or (e) naphthyl which is monosubstituted by a member selected from the group consisting of halogeno, alkyl of 1 to 4 carbon atoms, and alkoxy of 1 to 4 carbon atoms, and

each of R^1 and R^3 is independently selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms, alkynyl of 2 to 4 carbon atoms and alkoxyalkyl of 3 to 4 carbon atoms.

3,925,396

β-PYRIDYL-CARBONAMIDO-ALKANE-SULFONIC ACID SALTS

Jacques Baetz, La Garenne-Colombes, France, assignor to Seperic, Morat, France

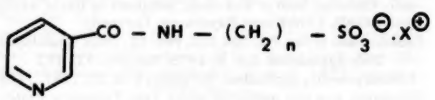
Filed Jan. 31, 1974, Ser. No. 438,368

Claims priority, application United Kingdom, Feb. 15, 1973, 7407/73

Int. Cl.[2] C07D *213/82*

U.S. Cl. 260—294.8 F 7 Claims

1. A β-pyridyl-carbonamido-alkane-sulfonic acid salt having the formula



in which *n* is an integer selected from 2 and 3 and X is a cation selected from choline, betaine, ethanolamine, pyridoxine and the pharmaceutically acceptable alkali and alkaline-earth metals.

3,925,397

3-PYRIDYLMETHYL-(N-SUBSTITUTED PHENYL)-CARBAMATE DERIVATIVES

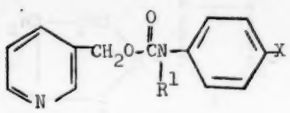
Edward E. Kilbourn, Chalfont, and Ernest D. Weiler, Ambler, both of Pa., assignors to Rohm & Haas Company, Philadelphia, Pa.

Filed Aug. 14, 1974, Ser. No. 497,542

Int. Cl.[2] C07D *213/84*

U.S. Cl. 260—294.9 8 Claims

1. A compound of the formula



wherein X is cyano, or nitro and R^1 is alkyl of 1 to 4 carbon atoms, allyl, benzyl.

3,925,398

3-ACETYL-1,4-DIHYDRO-4-OXO-1,8-NAPHTHYRIDINES

George Y. Lesher, and Ruth Pauline Brundage, both of Rensselaer, N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 453,928, March 22, 1974, Pat. No. 3,895,017, which is a division of Ser. No. 333,541, Feb. 20, 1973, Pat. No. 3,875,172. This application Nov. 1, 1974, Ser. No. 520,135

Int. Cl.² C07D *471/04*

U.S. Cl. 260—296 N 4 Claims

1. A compound selected from 3-acetyl-1,4-dihydro-7-Q-4-oxo-1,8-naphthyridine and its tautomeric 3-acetyl-4-hydroxy-7-Q-1,8-naphthyridine, where Q is lower-alkyl, loweralkanoyloxymethyl, hydroxymethyl, 4(or 3)-pyridyl or 4(or 3)-pyridyl having one or two lower-alkyl substituents.

3,925,399

BASIC ALUMINUM SALT OF 2-N-PROPYL-5-THIAZOLE-CARBOXYLIC ACID

Francois Clemence, Rosny-sous-Bois, and Odile Le Martret, Paris, both of France, assignors to Roussel-UCLAF, Paris, France

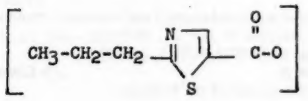
Filed Apr. 29, 1974, Ser. No. 465,188

Claims priority, application France, Mar. 26, 1974, 74.10277

Int. Cl.² C07D *277/56*; A61K *31/425*; C07F *5/06*

U.S. Cl. 260—299 1 Claim

1. The basic aluminum salt of 2-n-propyl-5-thiazole-carboxylic acid having the formula



3,925,400

CERTAIN 2-OXO-4-THIAZOLINE-5-CARBOXYLIC ACID ESTERS

Klaus Grohe, Cologne, and Paul-Ernst Frohberger, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 12, 1972, Ser. No. 271,104

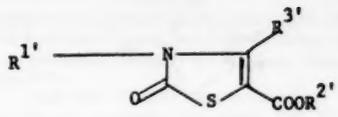
Claims priority, application Germany, July 28, 1971, 2137649

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C07D *277/14*

U.S. Cl. 260—306.7 R 4 Claims

1. Thiazolinone-(2)-carboxylic acid esters of the formula:



wherein

R^1 is selected from the group of C_1 to C_{12}-alkyl, phenyl, and phenyl substituted one or more times by fluorine, chlorine or bromine atoms or by C_1 to C_3-alkyl groups;

R^2 is selected from the group of C_1 to C_{12}-alkyl or [C_1+C_{12}] C_1 to C_{12}-alkyl substituted by phenyl which is itself optionally substituted one or more times by fluorine, chlorine or bromine atoms or by C_1 to C_3-alkyl; and

R^3 is the same as R^2 or is selected from the group of hydrogen, methoxy carbonyl, ethoxy carbonyl and phenyl which is itself optionally substituted one or more times by fluorine, chlorine or bromine atoms or by C_1 to C_3-alkyl.

3,925,401

PROCESS FOR THE PREPARATION OF DIBENZOTHIAZOLYL DISULPHIDE

Raymond Janin, Irigny, France, assignor to Rhone-Poulenc S.A., Paris, France

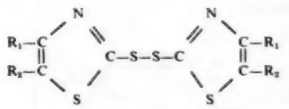
Filed Nov. 7, 1973, Ser. No. 413,574

Claims priority, application France, Nov. 8, 1972, 72.39514

Int. Cl.² C07D *277/78*

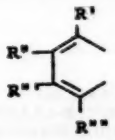
U.S. Cl. 260—306.5 7 Claims

1. Process for the preparation of a 2,2'-dithiazolyl disulphide of the general formula:



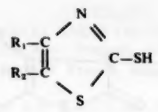
(I)

in which R_1 and R_2, which may be identical or different, each represents a hydrogen atom, a halogen atom, a nitro group, an alkyl or alkoxy radical containing 1 to 5 carbon atoms, or an unsubstituted aryl, haloaryl, nitroaryl, alkaryl or alkoxyaryl radical, where the aryl residue contains 6 to 12 carbon atoms and the alkyl or alkoxy residues contain 1 to 5 carbon atoms, or R_1 and R_2 together form a divalent radical of the general formula:



(II)

in which R', R'', R''' and R'''', which may be identical or different, each represents a hydrogen atom,, a halogen atom, a nitro group, an alkyl or alkoxy radical containing 1 to 5 carbon atoms, or an unsubstituted aryl, haloaryl, nitroaryl, alkaryl or alkoxyaryl radical where the aryl residue contains 6 to 12 carbon atoms and the alkyl or alkoxy residue contains 1 to 5 carbon atoms, which comprises oxidation of a 2-mercapto-thiazole of the general formula:



(III)

in which R_1 and R_2 are as defined above, using molecular oxygen and iron chloride in a solvent comprising a saturated aliphatic alcohol containing 1 to 10 carbon atoms, the proportion of iron chloride being 0.1 mol to 2 mols per mol of 2-mercaptothiazole.

3,925,402

1-THIADIAZOLYL-5-CARBAMOYLOXYIMIDAZOLIDINONES

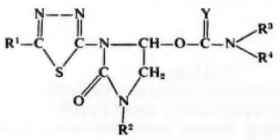
John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 425,272, Dec. 26, 1973, abandoned. This application Feb. 15, 1974, Ser. No. 442,934

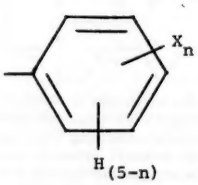
Int. Cl.² C07D *513/02*

U.S. Cl. 260—306.8 D **8 Claims**

1. A compound of the formula



wherein R^1 is selected from the group consisting of lower alkyl, lower alkenyl, lower haloalkyl, lower alkoxy, lower alkylthio, lower alkylsulfonyl and lower alkylsulfinyl; R^2 is lower alkyl R^3 is selected from the group consisting of hydrogen and lower alkyl; Y is selected from the group consisting of oxygen and sulfur; and R^4 is selected from the group consisting of hydrogen, lower alkyl, cycloalkyl of from 3 to 7 carbon atoms and



wherein X is selected from the group consisting of lower alkyl, halogen, lower haloalkyl and lower alkoxy, and *n* is an integer from 0 to 3.

3,925,403

CERTAIN 1-(2-SUBSTITUTED-1,3,4-THIADIAZOL-5-YL)--ALKYL-IMIDAZOLIDIN-2-ONES

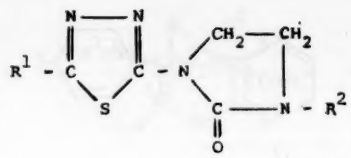
John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 433,181, Jan. 14, 1974, abandoned, which is a continuation-in-part of Ser. No. 223,011, Feb. 2, 1972, abandoned. This application Jan. 17, 1975, Ser. No. 541,746

Int. Cl.² C07D *513/02*

U.S. Cl. 260—306.8 D **6 Claims**

1. A compound of the formula



wherein R^1 is selected from the group consisting of isopropyl, t-butyl and trifluoromethyl; and R^2 is lower alkyl.

3,925,404

CARBOXYLIC ACID AMIDE AND HYDRAZIDE DERIVATIVES OF 4,5-DIPHENYLOXAZOLE AND PROCESS FOR PREPARING THEM

Enzo Marchetti, Rome, Italy, assignor to Instituto Farmacologico Serono S.p.A., Rome, Italy

Division of Ser. No. 119,832, March 1, 1971, Pat. No. 3,869,455. This application Apr. 23, 1973, Ser. No. 353,675

Claims priority, application Italy, Mar. 5, 1970, 21550/70

Int. Cl.² C07D *263/38*

U.S. Cl. 260—307 R **6 Claims**

1. 4,5-Diphenyl-2-oxazolyl-carboxylic acid N-methylamide.

3,925,405

TRIAZOLE-COUMARINS

Günther Boehmke, and Hans Theidel, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed Oct. 15, 1971, Ser. No. 189,773

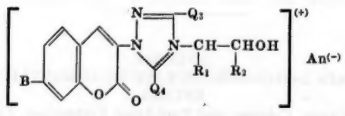
Claims priority, application Germany, Oct. 15, 1970, 2050726

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C07D *249/06, 249/08*

U.S. Cl. 260—308 R **5 Claims**

1. Coumarine compound of the formula:

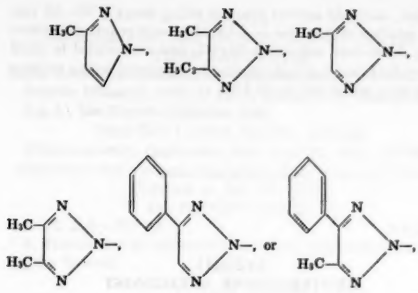


wherein

R_1 and R_2, independently of each other, are hydrogen, C_1–C_4-alkyl, or phenyl;

Q_3 and Q_4, independently of each other, are hydrogen, chloro, C_1–C_4-alkyl, phenyl, cyano, carboxyl, or carbonamido;

B is C_1–C_4-alkoxy,



An $^-$ is chloride, bromide, iodide, hydroxide, carbonate, bicarbonate, alkylsulphate, sulphate, disulphate, perchlorate, phosphate, benzenesulphonate, naphthalenesulphonate, 4-chlorobenzenesulphonate, oxalate, acetate, maleinate, propionate, methanesulphonate, chloroacetate, lactate, tartrate, glycerate, citrate, benzoate, formate or the anion of zinc chloride double salts.

3,925,406

DIALKOXYPHOSPHONOMETHYL DERIVATIVES OF HYDANTOINS

Daniel Porret, Fresens, NE, and Jürgen Habermeier, Pfeffingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

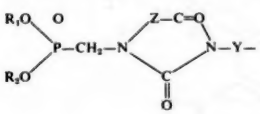
Continuation-in-part of Ser. No. 347,527, April 3, 1973, abandoned. This application Feb. 7, 1975, Ser. No. 548,050

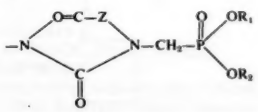
Claims priority, application Switzerland, Apr. 4, 1972, 4893/72

Int. Cl.² C07D *233/72*

U.S. Cl. 260—309.5 **7 Claims**

1. A dialkoxyphosphonomethyl derivative of hydantoin of the formula





wherein

Z denotes $-CR_3R_4-$ where R_3 and R_4 are alkyl of 1 to 6 carbon atoms or R_3 and R_4 together are tetramethylene or pentamethylene,

Y denotes alkylene of 1 to 12 carbon atoms or 3-oxapentamethylene, and

R_1 and R_2 are lower alkyl of 1 to 4 carbon atoms.

3,925,407

TRIGLYCIDYL COMPOUNDS AND THEIR USE

Friedrich Stockinger, Therwil, and Friedrich Lohse, Oberwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

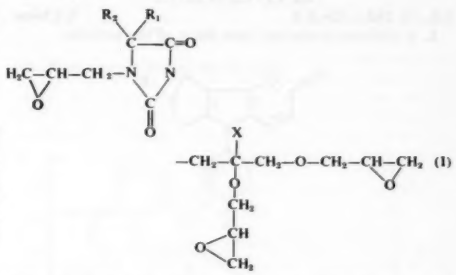
Filed Sept. 27, 1974, Ser. No. 509,876

Claims priority, application Switzerland, Oct. 10, 1973, 14394/73

Int. Cl.² C07D *49/32*

U.S. Cl. 260—309.5 **6 Claims**

1. Triglycidyl compounds of the formula I



wherein X denotes a hydrogen or methyl and R_1 and R_2 independently of one another each denote a hydrogen, alkyl, alkenyl, cycloalkyl or phenyl, which can be substituted, or wherein R_1 and R_2 together denote the tetramethylene or pentamethylene.

3,925,408

PYRAZOLINIUM COMPOUNDS AS HERBICIDES

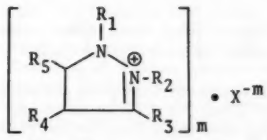
Barrington Cross, Rocky Hill, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed July 1, 1974, Ser. No. 484,515

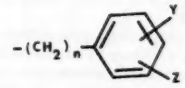
Int. Cl.² C07D *231/12;* **A01N** *9/22*

U.S. Cl. 260—311 **10 Claims**

1. A compound having the formula:



wherein R_1 and R_2 each represent alkyl C_1–C_4; R_4 represents a member selected from the group consisting of hydrogen, methyl, methoxy, methylthio, methylsulfinyl and methylsulfonyl; R_3 and R_5 each represent members selected from the group consisting of cycloalykl C_3–C_7, cycloalkylmethyl C_3–C_7, methylcycloalkyl C_5–C_7, cycloalkenyl C_5–C_7, alkyl C_2–C_{11}, thienyl and



provided that when R_4 is hydrogen at least one of R_3 and R_5 is a member other than phenyl; X represents an anion having a charge of from 1 to 3; *n* is an integer selected from 0 and 1; *m* is an integer selected from 1, 2 and 3; and Y and Z each represent members selected from the group consisting of

hydrogen, halogen, nitro, cyano, alkyl C_1–C_4, alkoxy C_1–C_4 and CF_3.

3,925,409

4-ARYL-1,2,3,4-TETRAHYDROPYRROLO[3,4-B]INDOLES

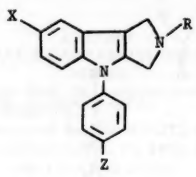
Willard M. Welch, Jr., North Stonington, and Charles A. Harbert, Waterford, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Apr. 1, 1974, Ser. No. 456,641

Int. Cl.² C07D *207/12*

U.S. Cl. 260—326.5 B **6 Claims**

1. A compound selected from those of the formula

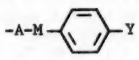


and the pharmaceutically acceptable acid addition salts thereof, wherein

X is selected from the group consisting of fluoro, chloro, bromo, methyl and hydrogen;

Z is selected from the group consisting of fluoro, methoxy, chloro and hydrogen; and

R is selected from the group consisting of alkyl having 1 to 6 carbon atoms, benzyl and substituted alkylene of the formula



wherein A is alkylene having 1 to 5 carbon atoms, M is selected from the group consisting of —CH=CH—, —CH_2—,

wherein R_1 is selected from the group consisting of hydrogen and alkanoyl having 2 to 5 carbon atoms and Y is selected from the group consisting of fluoro, methyl, chloro and hydrogen.

3,925,410

PROCESS FOR MAKING 1-PYRROLIDINYL METHYL FERROCENE

Dennis C. Van Landuyt, Auburn, and Orval E. Ayers, Huntsville, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 15, 1971, Ser. No. 155,672

Int. Cl.² C07D *207/04*; **C07F** *15/02*

U.S. Cl. 260—326.8 **1 Claim**

1. The process of producing 1-pyrrolidinyl-methylferrocene comprising reacting a mixture of (ferrocenylmethyl) trimethylammonium iodide, aqueous sodium hydroxide solution and pyrrolidine in a container that has a mechanical stirrer and reflux condenser, mechanically stirring the mixture and maintaining the mixture at reflux temperature for about 6 hours to produce a reaction product, and then extracting the reaction product with a suitable solvent, said (ferrocenylmethyl) trimethylammonium iodide being present in a proportion of about 150 grams to about 120 ml of 1 molar solution of said aqueous sodium hydroxide, and to about 100 ml of said pyrrolidine, and said solvent solution being about a 50—50 volume solution of benzene and heptane, said reaction product being dried over anhydrous $MgSO_4$ and evaporated to yield the product said 1-pyrrolidinylmethylferrocene with a melting point from about 50° to 50.5°C.

3,925,411

OXOTREMORINE ANTAGONIST

Johan Richard Dahlbom, Sodertalje; Bo Lennart Karlen, Skarholmen, and Sune Gunnar Lindgren, Linkoping, all of Sweden, assignors to Aktiebolaget Astra, Sodertalje, Sweden

Continuation-in-part of Ser. No. 203,907, Dec. 1, 1971, abandoned, which is a continuation-in-part of Ser. No. 774,530, Nov. 8, 1968, abandoned. This application Nov. 15, 1972, Ser. No. 306,829

Claims priority, application United Kingdom, Nov. 9, 1967, 51146/67

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C07D *205/00*

U.S. Cl. 260—326.25 **1 Claim**

1. The compound N-(5-pyrrolidino-3-pentynyl)-pyrrolidin-2-one or its therapeutically acceptable salts.

3,925,412

CYCLOAMIDINES

Werner Obendorf; Irmgard Lindner; Ernst Schwarzinger, and Josef Krieger, all of Linz (Danube), Austria, assignors to Osterreichische Stickstoffwerk Aktiengesellschaft, Linz (Danube), Austria

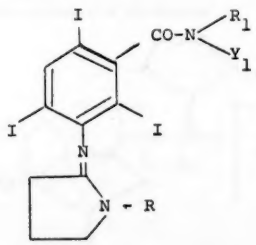
Filed July 20, 1793, Ser. No. 381,336

Claims priority, application Germany, July 21, 1972, 2235915

Int. Cl.² C07D *207/12*

U.S. Cl. 260—326.47 **12 Claims**

1. A compound selected from the group consisting of compounds of the formula



wherein Y_1 is —CH_2—COOH, —$(CH_2)_2$—COOH, CH_2—$CH(CH_3)$—COOH or CH_2—$CH(C_2H_5)$—COOH, R is methyl, ethyl, cyclohexyl, β-hydroxyethyl, β-methoxyethyl, γ-methoxypropyl or phenyl and R_1 is hydrogen, methyl, ethyl, propyl, allyl or γ-methoxypropyl, alkyl esters thereof wherein the alkyl group contains 1 to 4 carbon atoms and pharmaceutically acceptable salts thereof with bases.

3,925,413
PROCESS FOR THE PRODUCTION OF CYCLIC THIOCARBONATES

Paolo Koch, San Gialiano Milanese, and Emilio Perrotti, San Donato Milanese, both of Italy, assignors to Snamprogetti S.p.A., San Donato Milanese, Italy

Filed Oct. 1, 1973, Ser. No. 402,065
Claims priority, application Italy, Oct. 10, 1972, 30288/72
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² C07D *327/04*
U.S. Cl. 260—327 M **5 Claims**

1. Process for the production of cyclic thiocarbonates having the formula

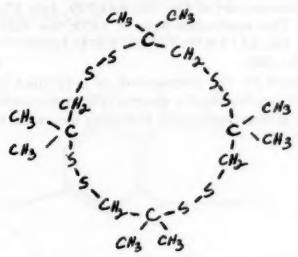
wherein A is a divalent alkyl radical having from 2 to 5 carbon atoms, separating the oxygen and sulfur atoms by two carbon atoms, characterized in that a thioglycol or a hydroxydisulphide having the general formula HO—A—SX, wherein X is a hydrogen atom or a radical —S—A—OH, wherein A is as defined above, is reacted with carbon mon-oxide and oxygen in the presence of a catalyst selected from Ni $(CO)_4$, $Co_2(CO)_8$,Fe $(CO)_5$, Mn $(CO)_6$ and Se (CO).

3,925,414
REACTION PRODUCT OF ISOBUTYLENE, SULFUR MONOHALIDE AND ALKALI METAL MERCAPTIDE

Phillip S. Landis, Woodbury, and Abraham O. M. Okorodudu, West Deptford, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 22, 1974, Ser. No. 453,610
Int. Cl.² C07D *341/00*
U.S. Cl. 260—327 R **12 Claims**

1. A compound having the structure:

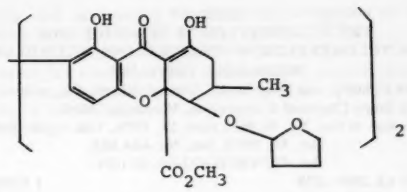


3,925,415
METHOD FOR MANUFACTURE OF NOVEL COMPOUNDS

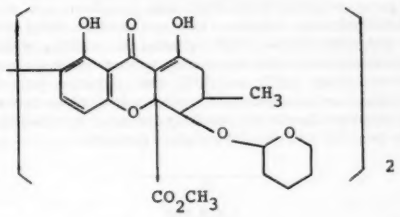
Torao Ishida; Junichi Ohoishi, both of Shizuoka, Japan; Kouichi Yoshida, Cleveland, Ohio; Kageyasu Akashi, Shizuoka, Japan; Isao Takeda, deceased, late of Tokyo, Japan, and by Emiko Takeda, legal representative, Osaka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 6, 1974, Ser. No. 467,468
Claims priority, application Japan, May 9, 1973, 48-50658
Int. Cl.² C07D *311/86*
U.S. Cl. 260—335 **2 Claims**

1. A compound having the formula:



2. A compound having the formula:

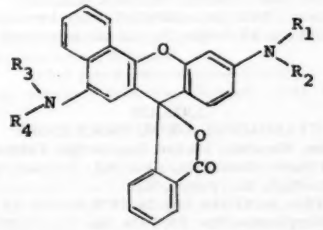


3,925,416
BENZ[C]FLUORAN COMPOUNDS AND RECORDING SHEET CONTAINING THE SAME

Takashi Akamatsu, Ashiya; Koichi Koga, Toyonaka; Mitsuru Kondo, Kawanishi; Makoto Miyake, Nishinomiya, and Hiroshi Iwasaki, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka and Kanzaki Paper Manufacturing Co., Ltd., Tokyo, both of, Japan

Continuation of Ser. No. 188,529, Oct. 12, 1971, abandoned. This application June 27, 1974, Ser. No. 483,519
Claims priority, application Japan, Oct. 13, 1970, 45-90245; Nov. 4, 1970, 45-97426; Dec. 25, 1970, 45-129018; Dec. 26, 1970, 45-130391
Int. Cl.² C07D *407/04*
U.S. Cl. 260—335 **5 Claims**

1. A compound of the formula



wherein R_1 and R_2 are respectively methyl or ethyl and R_3 and R_4 are respectively hydrogen or benzyl.

3,925,417
TRICYCLOHEXYLIDENE PEROXIDE AND DICYCLOHEXYLIDENE PEROXIDE AND METHOD OF PRODUCING THE SAME

Paul R. Story, and Peter Busch, both of Athens, Ga., assignors to Story Chemical Corporation, Muskegon, Mich.

Division of Ser. No. 50,963, June 29, 1970. This application Oct. 10, 1973, Ser. No. 404,885
Int. Cl.² C07D *323/00, 323/04*
U.S. Cl. 260—338 **1 Claim**

1. A method for the preparation of a mixture of tricyclohexylidene peroxide and dicyclohexylidene peroxide which comprises forming a reaction mixture consisting essentially of 1-hydroperoxy-1′-hydroxydicyclohexyl peroxide containing about 50–300% by weight water, an organic solvent selected from the group consisting of pentane, hexane, heptane, cyclohexane, decane, cyclodecane, nonane, undecane, dodecane, benzene, toluene, xylene, ether, carbon tetrachloride, chloroform and acetonitrile and a strong acid catalyst selected from the group consisting of perchloric acid, phosphoric acid, p-toluenesulfonic acid, anhydrous hydrogen chloride, sulfur trioxide and sulfur dioxide, while agitating the resulting mixture maintaining the reaction mixture at a temperature in the range between about −78°C. and 50°C. and recovering from the resulting reaction mixture the organic solvent phase containing dissolved therein the resulting produced tricyclohexylidene peroxide and dicyclohexylidene peroxide.

3,925,418
HEMISOLVATE OF D-(-)-2-(P-HYDROXYPHENYL)GLYCYL CHLORIDE HYDROCHLORIDE AND PROCESS

Walter A. Williams, Jamesville, and Herbert H. Silvestri, Dewitt, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed June 19, 1974, Ser. No. 480,895
Int. Cl.² C07D *319/12*
U.S. Cl. 260—340.6 **4 Claims**

1. The crystalline hemi-dioxane solvate of D-(−)-2-(p-hydroxyphenyl)glycyl chloride hydrochloride containing one mole of dioxane for every two moles of D-(−)-2-(p-hydroxyphenyl)glycyl chloride hydrochloride.

3,925,419
5-CYCLIC ETHYLENE ACETALS OF 5-OXOCYCLOPENTANE HEPTANOIC ACIDS AND ESTERS

Norman L. Wendler, Summit, and David Taub, Metuchen, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 48,548, June 22, 1970, Pat. No. 3,736,335. This application Nov. 24, 1972, Ser. No. 309,326
Int. Cl.² C07D *317/30*
U.S. Cl. 260—340.9 **3 Claims**

1. The 5-cyclic ethylene acetal of 3-hydroxy-2-(3-hydroxy-1-octenyl)-5-oxocyclopentane heptanoic acid.

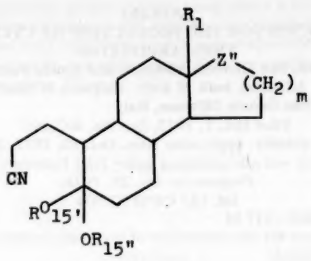
2. 3-Acetoxy-2-(3-oxo-1-octenyl)-5-oxocyclopentane heptanoic acid lower alkyl ester, 5-cyclic ethylene acetal.

3,925,420
CYANOALKYL A-RING PROCURSORS

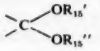
Noal Cohen, Montclair; Michael Rosenberger, Caldwell, and Gabriel Saucy, Essex Fells, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 67,296, Aug. 26, 1970, Pat. No. 3,813,417. This application Mar. 13, 1974, Ser. No. 450,709
Int. Cl.² C07D *317/30, 319/06, 321/00, 321/04*
U.S. Cl. 260—340.9 **5 Claims**

1. The compound of the formula



where R_1 is a primary alkyl group of from 1 to 5 carbon atoms; Z″ is a group of the formula



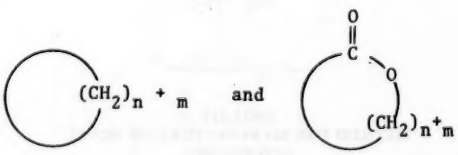
where R_{15}', and R_{15}'' taken together are lower alkylene having from 1 to 4 carbon; and m is 1 or 2.

3,925,421
METHOD FOR THE PREPARATION OF MACROCYCLIC COMPOUND

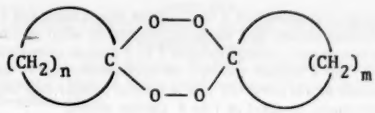
Paul Richard Story, Athens, Ga.; Peter Busch, Willich, Germany; Donald Derby Denson, Kettering, Ohio, and Carl Edward Wright, Athens, Ga., assignors to Research Corporation, New York, N.Y.

Division of Ser. No. 238,936, March 28, 1972, abandoned, Continuation-in-part of Ser. No. 842,739, July 17, 1969, abandoned. This application Mar. 9, 1973, Ser. No. 339,906
Int. Cl.² C07D *313/00;* **C07C** *13/27*
U.S. Cl. 260—343 **6 Claims**

1. A method for the preparation of a product consisting essentially of a mixture of a macrocyclic hydrocarbon and a macrocyclic lactone having the following structural formulae, respectively:



wherein n is a positive integer of from 4 to 17 and m is a positive integer of from 4 to 17 consisting essentially of heating a mixture consisting essentially of (1) a peroxide having the structural formula:



and (2) an alkane which is a solvent for said peroxide at a temperature of from about 100°C to about 350°C for a time sufficient to decompose said peroxide to said macrocyclic compounds; the weight ratio of said alkane to said peroxide being at least about 1:1.

3,925,422

PREPARATION OF 3,4,5,6,7,8-HEXAHYDROCOUMARIN

Sijbrandus E. Schaafsma, Beek(L), and Johannes J. M. Deumens, Limbricht, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Feb. 27, 1973, Ser. No. 336,243

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C07D *311/74*

U.S. Cl. 260—343.2 R **9 Claims**

1. A process for the preparation of 3,4,5,6,7,8-hexahydrocoumarin by the lactonization of 2-(β-carboxyethyl)-cyclohexanone, said process comprising lactonizing the carboxyethylcyclohexanone by heating the carboxyethylcyclohexanone, in the presence of a catalytic amount of a strong acid having an atmospheric boiling point greater than 200°C, to a temperature of about 140 to about 245°C, at a pressure of about 6 to about 200 mm Hg and recovering hexahydrocoumarin from the resulting vapor.

3,925,423

RESORCYCLIC ACID LACTONES AND THEIR PRODUCTION

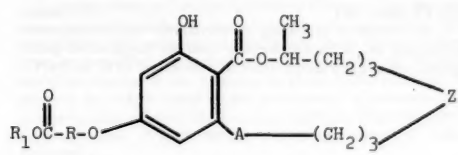
Edward B. Hodge, Terre Haute, Ind., assignor to Commercial Solvents Corporation, Terre Haute, Ind.

Filed Jan. 22, 1974, Ser. No. 435,497

Int. Cl.² C07D *313/00*

U.S. Cl. 260—343.2 F **11 Claims**

1. A compound of the formula:



wherein —A— is either $-CH_2-CH_2-$ or $-CH=CH-$, >Z is either $>CH_2$, >C=O or >CH—OH, R is lower alkylene, and R_1 is lower alkyl.

3,925,424

PROCESS FOR PREPARING 4-CHLOROFORMYL PHTHALIC ACID ANHYDRIDE

Paul Riegger, Augustiner Str. 1, 521 Troisdorf-Sieglar, and Hermann Richtzenhain, 5066 Schwellenbach/Post Marialinden, both of Germany

Filed Mar. 8, 1972, Ser. No. 233,383

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl. C07D *307/89*

U.S. Cl. 260—346.3 **10 Claims**

1. A method for preparing a 4-chloroformyl phthalic acid anhydride which comprises contacting a trimellitic acid anhydride with an aromatic trichloromethyl compound of the formula:

$$R(-CCl_3)_a,$$

wherein R represents a mono- or polynuclear aromatic radical and *a* is a number from 1 to 6 in the presence of ferric chloride, at 80° to 200°C.

3,925,425

PROCESS FOR PRODUCING ANHYDRIDES OF AROMATIC POLYCARBOXYLIC ACIDS

Emmanuel R. E. G. Draguez de Hault, Waterloo; Henri R. Debus, Meise, and Marcel Van Tongelen, Diegem, all of Belgium, assignors to Labofina S.A., Brussels, Belgium

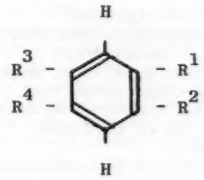
Filed Oct. 26, 1973, Ser. No. 410,275

Claims priority, application Belgium, May 4, 1973, 13073

Int. Cl.² C07D *307/89*

U.S. Cl. 260—346.4 **12 Claims**

1. A process for producing anhydrides of benzenepolycarboxylic acids by the vapor-phase oxidation of aromatic hydrocarbons selected from the group consisting of naphthalene, octahydroanthracene and polyalkylbenzenes containing at least two alkyl substituents in ortho position to one another and having the general formula



wherein R^1 and R^2 are alkyl radicals having a straight or branched chain and containing 1 to 6 carbon atoms and R^3 and R^4 are radicals selected from the group consisting of hydrogen and alkyl radicals containing 1 to 4 carbon atoms, the total number of carbon atoms of said polyalkylbenzenes being no higher than 18, said process comprising oxidizing said aromatic hydrocarbons at a temperature of between about 300° and 550°C and in the presence of a catalyst consisting of a refractory carrier and vanadium oxide, said catalyst prepared by impregnating said refractory carrier with an oxytrihalide of vanadium in which the halide is selected from the group consisting of chlorine and bromine, hydrolyzing said oxytrihalide of vanadium and then calcining said catalyst.

3,925,426

PROCESS FOR THE PRODUCTION OF 1-NITROANTHRAQUINONE

Axel Vogel, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 2, 1973, Ser. No. 376,042

Claims priority, application Germany, July 6, 1972, 2233185

Int. Cl.² C07C *79/37*

U.S. Cl. 260—369 **15 Claims**

1. In a process for preparing 1-nitroanthraquinone by nitrating anthraquinone the improvement which comprises carrying out the nitration in the presence of at least one organic solvent which is inert under the reaction conditions said solvent being selected from the group consisting of aliphatic and alicyclic hydrocarbons with up to 12 carbon atoms and the foregoing substituted one or more times by halogen or nitro.

3,925,427
MANUFACTURE OF ANTHRAQUINONOID DISPERSE DYES CONTAINING BROMINE

Wolfgang Elser; Heinz Eilingsfeld, both of Frankenthal, and Werner Schoch, Eschelbronn, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed July 8, 1974, Ser. No. 486,418

Claims priority, application Germany, July 7, 1973, 2334657

Int. Cl.² C07C *97/26;* **C09B** *1/50*

U.S. Cl. 260—380 **10 Claims**

1. In a process for the preparation of blue anthraquinonoid disperse dyes containing bromine, wherein 1,5-dinitro-4,8-dimethoxyanthraquinone, 1,8-dinitro-4,5-dimethoxyanthraquinone or mixtures thereof, are reduced and the reaction product is brominated in an acid medium within the range from 96% strength by weight sulfuric acid to 5% strength by weight oleum, or in an organic solvent which is inert under the reaction conditions, at a temperature of from room temperature to 135°C, until the reaction product contains from 12 to 30% by weight of bromine, the improvement which comprises carrying out the reduction of said dinitro-dimethoxyanthranquinones in oleum which contains from 20 to 45% by weight of sulfur trioxide, with not less than the stoichiometrically required amount of sulfur in the presence of boric acid at a temperature of from −10 to +50°C.

3,925,428
HYDROXY-ALUMINUM NITRATE POLYMER PRODUCTION

Clive Hodgson, Forest Knolls, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 8, 1974, Ser. No. 458,631

Int. Cl.² C01B *21/40*

U.S. Cl. 423—394 **6 Claims**

1. A process of preparing hydroxy-aluminum nitrate of the empirical formula

$$Al(OH)_{2d}(NO_3)_{(3-2d)}$$

wherein *d* varies from about 0.1 to 1.4 and ammonium nitrate by reacting aluminum nitrate and urea, wherein the molar ratio of aluminum mitrate to urea varies from about 1:0.1 to 1:1.4, at a temperature of about 50 to 150°C, in aqueous solution of about 1 mol to 1,000 mols of water per mol urea.

3,925,429
UNSATURATED ETHER AND THIOETHER AMIDES

Hans-Peter Schelling, Oberwil, and Fritz Schaub, Basel, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

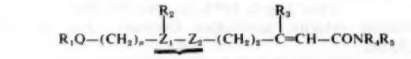
Continuation-in-part of Ser. No. 257,671, May 30, 1972, abandoned. This application Dec. 19, 1973, Ser. No. 426,427

Claims priority, application Switzerland, June 2, 1971, 8036/71

Int. Cl.² C07C *103/175, 149/23;* **A01N** *9/20, 9/12*

U.S. Cl. 260—404 **3 Claims**

1. A compound of the formula:



wherein

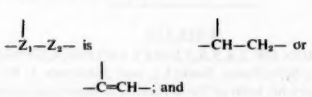
R_1 is alkyl of 1 to 10 carbon atoms; alkenyl of 3 to 10 carbon atoms; alkynyl of 3 to 10 carbon atoms; cycloalkyl of 3 to 6 carbon atoms; cycloalkyl of 3 to 6 carbon atoms mono substituted by alkyl of 1 to 4 carbon atoms; cycloalkenyl of 5 to 7 carbon atoms; cycloalkenyl of 5 to 7 carbon atoms mono substituted by alkyl of 1 to 4 carbon atoms; cycloalkyl(of 3 to 6 carbon atoms)alkyl (of 1 to 4 carbon atoms); cycloalkyl(of 3 to 6 carbon atoms)alkyl (of 1 to 4 carbon atoms) ring mono substituted by alkyl of 1 to 4 carbon atoms; cycloalkenyl(of 5 to 7 carbon atoms)alkyl (of 1 to 4 carbon atoms); or cycloalkenyl(of 5 to 7 carbon atoms)alkyl (of 1 to 4 carbon atoms) ring mono substituted by alkyl of 1 to 4 carbon atoms;

R_2 and R_3, which are the same or different, are each hydrogen or alkyl of 1 to 4 carbon atoms,

R_4 and R_5, which are the same or different, are each hydrogen or alkyl of 1 to 4 carbon atoms, or

R_4 and R_5 together with the nitrogen atom form a pyrrolidino, piperidino or morpholino ring;

Q is oxygen or sulphur;



n is an integer 1, 2 or 3.

3,925,430
PREPARATION OF ALKYLAMIDES

Roger G. Duranleau, Ardonia, and John M. Larkin, Wappingers Falls, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 12, 1974, Ser. No. 532,289

Int. Cl.² C07C *103/02*

U.S. Cl. 260—404 **20 Claims**

1. A method of preparing an alkylamide which comprises contacting a nitroketone with an acidic mineral acid salt as catalyst in the presence of a carboxylic acid solvent.

3,925,431
THERMAL PREPARATION OF ALKYLAMIDES

Roger G. Duranleau, Ardonia, and John F. Matteo, Wappingers Falls, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 12, 1974, Ser. No. 532,423

Int. Cl.² C07C *103/02*

U.S. Cl. 260—404 **16 Claims**

1. A method of preparing an alkylamide which comprises contacting an alpha-nitroketone with an oxygenated polar aprotic solvent at a temperature of from about 70°C. to 200°C.

3,925,432
BORONATED TETRACYCLINE COMPOUNDS

William C. Gillchriest, Los Angeles, Calif., assignor to Smyth, Roston & Pavitt, Los Angeles, Calif.

Filed Mar. 7, 1972, Ser. No. 232,620

Int. Cl.² C07C *103/19*

U.S. Cl. 260—429.7 **10 Claims**

1. A compound in which a substituent group having the structure

is bonded to the 7-position of tetracycline or anhydrotetracycline, and

wherein A is methylene, ethylene or phenylene and R is carborano or dodecacarborano.

3,925,433
1:1 AND 2:1 CHROMIUM, ALPHA AMINO ACID COMPLEX SALTS

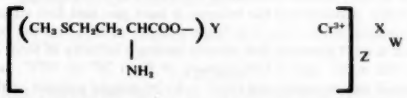
Mahmond M. Abdel-Monem, St. Paul, and Dean R. Anderson, Excelsior, both of Minn., assignors to Zinpro Corporation, Excelsior, Minn.

Continuation-in-part of Ser. No. 395,848, Sept. 10, 1973, which is a continuation-in-part of Ser. No. 163,046, July 15, 1971, abandoned. This application Sept. 24, 1973, Ser. No. 400,231

Int. Cl.² C07F *11/00*

U.S. Cl. 260—438.5 R **7 Claims**

1. In solid form, a water soluble methionine chromium complex salt, of the formula:



wherein Y is a whole integer and is 1 or 2, X is inorganic anion selected from the group consisting of chloride, sulphates, phosphates, and acetate, and Z and W are whole integers selected to electrostatically balance the cationic and anionic charges of the complex salt, said salt having the capability of enhancing the nutrition and health of animals and humans by effectively increasing the absorption, distribution, and utilization of chromium and methionine within the body system of said animals and humans.

3,925,434
THE REACTION OF CHLOROSILANES WITH UNSATURATED ORGANIC COMPOUNDS

Vincent T. Chuang, Marietta, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Jan. 22, 1975, Ser. No. 543,128

Int. Cl.² C07F *7/08, 7/12, 7/14*

U.S. Cl. 260—448.2 E **13 Claims**

1. In the platinum catalyzed addition reaction of a chlorosilane, containing at least one hydrogen bonded to silicon, with an olefinically unsaturated hydrocarbon other than acrylonitrile, an improved method which comprises carrying out said addition reaction in the presence of about 0.001 to about 10 percent, by weight based on the total weight of reactants of a promoter selected from the group consisting of phenothiazine, diphenylamine, N,N-diphenyl-p-phenylenediamine or phenoxazine.

3,925,435
PRODUCTION OF ISOCYANATES

John Crosby; Robert Michael Paton, and Robert Allan Campbell Rennie, all of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

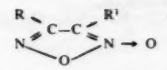
Filed July 5, 1973, Ser. No. 376,298

Claims priority, application United Kingdom, July 21, 1972, 34203/72

Int. Cl.² C07C *118/00*

U.S. Cl. 260—453 P **12 Claims**

1. A process for the preparation of mono- or di-isocyanates in which a furoxan of general formula



where R and R¹, which may be the same or different, represent aliphatic hydrocarbyl groups containing from 1 to 18 carbon atoms which may bear alkoxy groups, aryl groups or halogen atoms as substituents, and may be linked one to another to form a ring system which may contain both aliphatic and aromatic components, provided that that part of said ring which is fused directly to the furoxan ring is aliphatic, is heated to a temperature at which the furoxan ring is opened to produce at least one mono-isocyanate when R and R¹ are separate groups or a di-isocyanate when R and R¹ are linked.

3,925,436
PROCESS FOR PRODUCTION OF AROMATIC ISOCYANATES

Takeshi Yamahara, Itami, and Masahiro Usui, Takatsuki, both of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Filed Mar. 22, 1974, Ser. No. 453,956

Claims priority, application Japan, Mar. 23, 1973, 48-33910

Int. Cl.² C07C *118/06*

U.S. Cl. 260—453 PC **11 Claims**

1. A process for producing aromatic isocyanates which comprises reacting an aromatic nitro compound with carbon monoxide in the presence of a catalyst at an elevated temperature under an elevated pressure, the said catalyst being a product obtained by contacting a halogen-containing platinum group metal compound selected from the group consisting of the halides, carbonyl halides, complexes and complex salts of palladium, rhodium, iridium, ruthenium, platinum and osmium with a copolymer of styrene, vinylpyridine and divinylbenzene.

3,925,437
REDUCTION OF ACIDITY OF ORGANIC POLYMERIC ISOCYANATES

Richard Lee Rowton, Austin, Tex., assignor to Jefferson Chemical Company, Inc., Houston, Tex.

Filed July 18, 1974, Ser. No. 489,819

Int. Cl.² C07C *119/042*

U.S. Cl. 260—453 SP **9 Claims**

1. A process for the reduction of the acidity of methylene-bridged polyphenyl polyisocyanate mixtures which comprises: admixing a methylene-bridged polyphenyl polyisocyanate mixture of methylene diphenylisocyanate isomers and higher functionality polymethylene polyphenylisocyanates with a lower alkylene oxide compound containing from 2 to about 4 carbon atoms per molecule, said lower alkylene oxide compound being admixed in an amount at least in excess of the stoichiometric amount, based upon the amount of acid present in the methylene-bridged polyphenyl polyisocyanate mixture.

3,925,438
FLUORINATED URETHANE-N-SULFONIC ACID ESTERS

Heinz Brecht, Bad Soden, Taunus, and Dieter Hoffmann, Bobingen, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 2, 1974, Ser. No. 485,242

Claims priority, application Germany, July 6, 1973, 2334346

Int. Cl.² C07C *143/00*

U.S. Cl. 260—456 A **9 Claims**

1. A compound of the formula

$$R_f—(CH_2)_n—O—(CH_2CH_2O)_m—CO—NH—SO_2—O—(CH_2CH_2O)_pH \quad (I)$$

in which

R_f is n-perfluoroalkyl of 6 to 10 carbon atoms,

n is a number of 1 to 2,

m is a number of zero to 4 and

p is a number of about 4 to about 50.

3,925,439

SUBSTITUTED O-(AMINOSULFONYL)-GLYCOLIC ANILIDES

Adolf Fischer, Mutterstadt; Gerhard Hamprecht, Mannheim; Dietrich Mangold, Neckargemuend, and Wolfgang Rohr, Mannheim, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

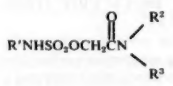
Division of Ser. No. 321,548, Jan. 5, 1973, Pat. No. 3,870,740. This application Sept. 3, 1974, Ser. No. 502,746

Claims priority, application Germany, Jan. 13, 1972, 2201432

Int. Cl.² C07C *143/02*

U.S. Cl. 260—456 A **6 Claims**

1. A substituted O-(aminosulfonyl)-glycolic anilide of the formula



where R′ denotes hydrogen or alkyl of one to six carbon atoms, R^2 denotes phenyl, and R^3 denotes alkenyl of three to six carbon atoms.

3,925,440

CARBOXAMIDES

Michael Edward McMenim, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

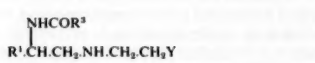
Division of Ser. No. 270,928, July 10, 1972, Pat. No. 3,845,070. This application May 31, 1974, Ser. No. 475,272

Claims priority, application United Kingdom, July 27, 1971, 35206/71

Int. Cl.² C07C *103/44, 103/82, 141/02*

U.S. Cl. 260—457 **7 Claims**

1. A compound which is a member selected from the group consisting of diethylamine derivatives of the formula:



wherein R^1 is a member selected from the group consisting of phenyl, nitrophenyl, aminophenyl and tolyl, and R^3 is a member selected from the group consisting of hydrogen, alkyl of not more than five carbon atoms, phenyl and benzyl and Y is a member selected from the group consisting of chlorine, bromine and hydrogen-sulphato.

3,925,441

ISOTHERMAL SULFONATION PROCESS

Sadao Toyoda; Toshiaki Ogoshi, both of Funabashi; Minoru Maruyama, Soka; Yozo Miyawaki, Narashino, all of Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed Oct. 24, 1973, Ser. No. 409,088

Int. Cl.² C07C *141/02, 143/16*

U.S. Cl. 260—458 **2 Claims**

1. In a process for sulfonating α-olefins having 8 to 30 carbon atoms, comprising flowing a thin film of said α-olefin having a temperature of from 10° to 45°C along an externally cooled reaction surface in a reaction zone, and contacting said film with a separately supplied first stream of a mixture of gaseous sulfur trioxide and inert gas and with a separately supplied second stream of cooling gas that flows in parallel with said film and said first stream and is located therebetween, the volumetric flow rate of said second stream being from 2 to 12 times the volumetric flow rate of the first stream, whereby to effect sulfonation, the improvement which comprises: the second gaseous stream consists essentially of a mixture of gaseous sulfur tri-oxide and inert gas and said second stream is flowed into the feed end of said reaction zone in parallel with, in contact with and between said film and said first stream so as to form at the feed end of said reaction zone a parallel flowing layer of said second gaseous stream between said film and said first stream, said second stream having a temperature of from 10° to 40°C and having a velocity in the range of from 1 to 1.4 times the velocity of the first stream, said second stream containing from 0.01 to 2 volume percent of sulfur trioxide and the balance is inert gas, said first stream containing from 3 to 15 volume percent of SO_3 and the balance is inert gas, said first stream having a velocity of from 20 to 100 m/sec and a temperature of from 20° to 50°C, said second stream supplying from 1 to 20 weight percent of the total SO_3 supplied by both the first and second streams.

2. In a process for sulfating condensation products of ethylene oxide with an aliphatic alcohol having 8 to 22 carbon atoms, comprising flowing a thin film of said condensation product having a temperature of from 10° to 45°C along an externally cooled reaction surface in a reaction zone, and contacting said film with a separately supplied first stream of a mixture of gaseous sulfur trioxide and inert gas and with a separately supplied second stream of cooling gas that flows in parallel with said film and said first stream and is located therebetween, the volumetric flow rate of said second stream being from 2 to 12 times the volumetric flow rate of the first stream, whereby to effect sulfation, the improvement which comprises: the second gaseous stream consists essentially of a mixture of gaseous sulfur trioxide and inert gas and said second stream is flowed into the feed end of said reaction zone in parallel with, in contact with and between said film and said first stream so as to form at the feed end of said reaction zone a parallel flowing layer of said second gaseous stream between said film and said first stream, said second stream having a temperature of from 10° to 40°C and having a velocity in the range of from 1 to 1.4 times the velocity of the first stream, said second stream containing from 0.01 to 2 volume percent of sulfur trioxide and the balance is inert gas, said first stream containing from 3 to 15 volume percent of SO_3 and the balance is inert gas, said first stream having a velocity of from 20 to 100 m/sec and a temperature of from 20° to 50°C, said second stream supplying from 1 to 20 weight percent of the total SO_3 supplied by both the first and second streams.

3,925,442

MONOMERIC EMULSION STABILIZERS

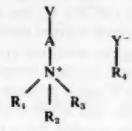
Carlos M. Samour, Wellesley Hills, Mass., assignor to The Kendall Company, Walpole, Mass.

Continuation of Ser. No. 110,588, Jan. 28, 1971, abandoned, which is a continuation-in-part of Ser. No. 769,355, Oct. 21, 1968, abandoned. This application Mar. 18, 1974, Ser. No. 452,073

Int. Cl.² C07C *141/00*

U.S. Cl. 260—459 **4 Claims**

1. A monomeric emulsion stabilizer of the formula



where

V is selected from the group consisting of 4-hydroxymaleoyloxy and 4-hydroxycitraconoyloxy radicals;

A is selected from the group consisting of ethylene and propylene; R_1, R_2, are methyl groups and R_3 is an acetamido group; Y=R_4 selected from the group consisting of alkyl phosphate and alkyl sulfate, said alkyl group containing 8 to 28 carbon atoms.

3,925,443

ALKYLSULPHURIC ACID SALTS OF SUBSTITUTED GUANIDINES

Engelbert Kühle, Berg. Gladbach; Ferdinand Grewe, Burscheid, and Helmut Kaspers, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

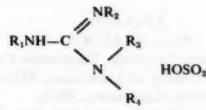
Filed Sept. 3, 1968, Ser. No. 757,091

Claims priority, application Germany, Sept. 14, 1967, 1668019The portion of the term of this patent subsequent to May 19, 1987, has been disclaimed.

Int. Cl.² C07C *141/02*

U.S. Cl. 260—459 R **10 Claims**

1. Alkylsulfuric acid salt of substituted guanidine having the formula



in which R_1 is selected from the group consisting of n-dodecyl and n-tetradecyl, R_2, R_3 and R_4 each individually is selected from the group consisting of hydrogen, alkyl having 1–4 carbon atoms and phenyl, and R_5 is alkyl having 1–4 carbon atoms, with the proviso that at least one of R_2, R_3 and R_4 is selected from the group consisting of such alkyl and phenyl.

3,925,444

LIQUID CRYSTALLINE ISONITRILES

Arthur Boller, Binningen, and Hanspeter Scherrer, Therwil, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

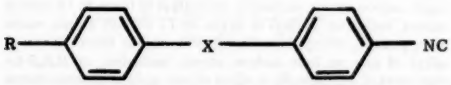
Filed Feb. 22, 1974, Ser. No. 444,923

Claims priority, application Switzerland, Mar. 2, 1973, 3099/73

Int. Cl.² C07C *119/02*

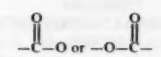
U.S. Cl. 260—463 **20 Claims**

1. A compound of the formula



wherein

X is



and R is straight-chain alkyl of 1 to 7 carbon atoms, straight-chain alkoxy of 1 to 7 carbon atoms, straight-chain alkanoyloxy of 1 to 7 carbon atoms or β-alkyloxycarbonyloxy wherein the alkoxy group is straight-chain alkoxy of 1 to 7 carbon atoms.

3,925,445

HYDROCYANATION OF OLEFINS

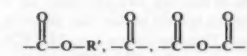
Charles Morgan King, Wilmington, Del.; William Carl Seidel, Orange, Tex., and Chadwick Alma Tolman, Wilmington, Del., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 168,352, Aug. 2, 1971, Pat. No. 3,798,256. This application Oct. 17, 1973, Ser. No. 407,265The portion of the term of this patent subsequent to Mar. 19, 1991, has been disclaimed.

Int. Cl.² C07C *120/02*

U.S. Cl. 260—465 R **12 Claims**

1. In a process of hydrocyanating an olefinic unsaturated organic compound containing from 2 to 20 carbon atoms and having at least one olefinic carbon-carbon double bond, the olefinic unsaturated organic compound being selected from the group consisting of (a) monoolefinic aliphatic and aromatic hydrocarbons and monoolefinic aliphatic and aromatic hydrocarbons containing a functional group of the group consisting of —OR′,



and —NR'_2 wherein R′ is selected from group consisting of hydrogen, alkyl and aryl radicals having up to 10 carbon atoms and each open bond other than that required for connection of the functional group to the olefinic radical is connected to a radical of the group consisting of hydrogen, aliphatic and aromatic hydrocarbon radicals, wherein the carbon-carbon double bond is separated from the aforesaid functional group by at least one carbon atom, and (b) polyoelfinic aliphatic compounds wherein the carbon-carbon double bonds are separated from each other by at least one carbon atom;

the improvement which comprises reacting the unsaturated compound with hydrogen cyanide in the presence of an olefin-bonded zerovalent nickel complex of the formula $Ni(PXYZ)_2A$; wherein X is OR, Y and Z are R or OR and R is an alkyl or aryl radical having up to 18 carbon atoms; wherein the R radicals of a given PXYZ ligand may be cojoined, may be the same or different and are so chosen that the ligand has a cone angle with an average value between 130° and 170°;

wherein A is an unsaturated organic compound containing from 2 to 20 carbon atoms and having at least one olefinic carbon-carbon double bond, the unsaturated organic compound being selected from the group consisting of (a) monoolefinic aliphatic and aromatic hydrocarbons and monoolefinic and aromatic hydrocarbons containing a functional group, the functional group being as defined above, and (b) polyolefinic aliphatic compounds wherein the carbon-carbon double bonds are separated from each other by at least one carbon atom;

at a temperature in the range of −50°C. to 150°C. and at a pressure in the range of about 0.05 to about 100 atmospheres, the molar ratio of the unsaturated compound to the complex being from 1:2 to 2000:1; and recovering an organic cyano compound wherein said olefinic unsaturation is the sole aliphatic unsaturation present.

3,925,446
1-ARYLOXY-2-HYDROXY-3-ALKYNYLAMINO-PROPANES

Herbert Köppe; Werner Kummer; Helmut Stähle, and Gojko Muacevic, all of Ingelheim am Rhein, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

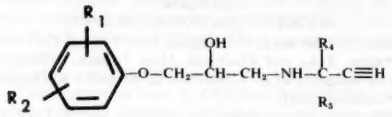
Filed Feb. 22, 1974, Ser. No. 444,713

Claims priority, application Germany, Feb. 28, 1973, 2309887; Jan. 26, 1974, 2403809

Int. Cl.[2] C07C *121/80*

U.S. Cl. 260—465 E **6 Claims**

1. A racemic or optically active compound of the formula



wherein

R_1 is $-(CH_2)_x-CN$, where X is 0, 1, 2 or 3,

R_2 is hydrogen, halogen or —NH—CO—NHR, where R is lower alkyl,

R_4 is alkyl of 1 to 3 carbon atoms, and

R_5 is alkyl of 1 to 3 carbon atoms or, together with R_4, $-(CH_2)_p-$ where p is 4, 5 or 6,

or a physiologically compatible acid addition salt thereof.

3,925,447
PRODUCTION OF NITRILES

Abraham P. Gelbein, Plainfield, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Division of Ser. No. 147,159, May 26, 1971, which is a continuation-in-part of Ser. No. 803,874, Feb. 27, 1969, abandoned. This application Apr. 24, 1974, Ser. No. 463,758

Int. Cl.[2] C07C *120/14*

U.S. Cl. 260—465 C **11 Claims**

1. A process for producing a nitrile, comprising:

contacting ammonia with a hydrocarbon selected from the group consisting of alkyl substitued benzenes and alkyl substituted naphthalenes wherein the alkyl group contains no more than four carbon atoms, isobutylene and propylene, in the presence of a metal oxide supported on a porous support, said support containing from about 25% to about 75%, by weight, of the metal oxide having been placed in molten form substantially entirely within the pores of the support, the support having a surface area greater than about 50 meter square per gram and a porosity greater than about 0.4 cc per gram, said metal oxide being selected from the group consisting of vanadia, molybdena and mixtures thereof, and said support being selected from the group consisting of gamma-alumina and silica-alumina.

3,925,448
PROCESS FOR PRODUCING NITRILOTRIACETONITRILE

Carroll W. Lanier, Baker, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Sept. 30, 1970, Ser. No. 76,812

Int. Cl.[2] C07C *121/43*

U.S. Cl. 260—465.5 A **11 Claims**

1. A process for producing nitrilotriacetonitrile which comprises:

forming at a temperature of from about 50° to about 120°F an aqueous system of ammonium ion $(NH_4)^+$, sulfate ion $(SO_4)^{--}$ and formaldehyde wherein the ratio of mols of formaldehyde to ammonium ions is from about 2.9:1 to about 3.1:1, and the ratio of sulfate ions $(SO_4)^{--}$ to ammonium ions $(NH_4)^+$ is from about 0.175 to about 0.5, and

reacting said system with hydrogen cyanide wherein the ratio of mols of (HCN) to the total ammonium ions $(NH_4)^+$ of said system is from about 2.9:1 to about 3.1:1 while maintaining the resultant system in a substantially liquid-full state at a reaction temperature of from about 120° to about 250°F and a pressure of from about 15 psig to about 200 psig, and while avoiding the presence of HCN vapor in the process, for a time of from about 10 minutes up to about 6 hours and sufficient to produce nitrilotriacetonitrile.

3,925,449
DIMERIC CHLOROACETONITRILE AND METHOD FOR MAKING THE SAME

Hans-Joachin Teuber, Fichtenstr. 13, D 6242 Kronberg, and Günther Schutz, Konigsteiner Str. 32 A, D 623 Frankfurt-Hochst, both of Germany

Filed June 18, 1974, Ser. No. 480,369

Claims priority, application Germany, June 23, 1973, 2332024

Int. Cl.[2] C07C *120/00, 121/42*

U.S. Cl. 260—465.5 R **2 Claims**

1. α,γ-dichloro-β-amino-crotonic acid nitrile.

3,925,450
PGA_3 ANALOGS

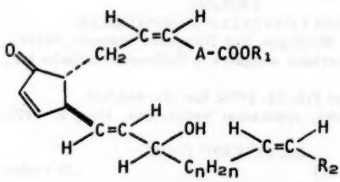
Udo F. Axen, Comstock Township, Kalamazoo County, Township of Comstock, County of Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 112,032, Feb. 2, 1971, Pat. No. 3,775,462, which is a continuation-in-part of Ser. No. 30,312, April 20, 1970, abandoned. This application Nov. 5, 1973, Ser. No. 412,970

Int. Cl.[2] C07C *61/38, 64/74*

U.S. Cl. 260—468 D **13 Claims**

1. A racemic mixture of a compound of the formula:

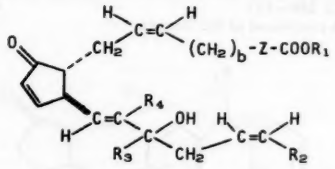


XLVIII

and its mirror image, wherein R_1 is hydrogen, alkyl of one to eight carbon atoms, inclusive, cycloalkyl of three to 10 carbon atoms, inclusive, aralkyl of seven to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one to three chloro or alkyl of one to four carbon atoms, inclusive, or β,β,β-trichloroethyl; wherein R_2 is alkyl of one to four carbon atoms, inclusive, substituted with zero to three fluoro; wherein n is an integer of one to four, inclusive; wherein A is alkylene of one to 10 carbon atoms, inclusive, substituted with zero to two fluoro, and with one to five carbon atoms, inclusive, between $-COOR_1$ and

or a pharmacologically acceptable salt thereof when R_1 is hydrogen.

8. An optically active compound of the formula:



or a racemic compound of that formula and the mirror image thereof, wherein R_1 is hydrogen, alkyl of one to eight carbon atoms, inclusive, cycloalkyl of three to 10 carbon atoms, inclusive, aralkyl of seven to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to four carbon atoms, inclusive, or β,β,β-trichloroethyl; wherein R_2 is alkyl of one to four carbon atoms, inclusive, substituted with zero to three fluoro; wherein R_3 and R_4 are hydrogen or alkyl of one to four carbon atoms, inclusive; wherein Z is ethylene substituted by one or 2 fluoro; wherein *b* is zero, one, 2, or 3; or a pharmacologically acceptable salt thereof when R_1 is hydrogen.

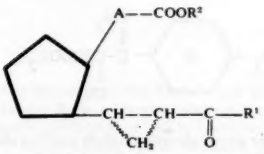
3,925,451

13,14ξ-METHYLENE-15-OXOPROSTANOIC ACID DERIVATIVES

Kiyoshi Sakai; Kenji Inoue; Yawara Tajima; Mitsuo Yamazaki; Kazuo Ohuchi, and Takashi Yusa, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed May 15, 1974, Ser. No. 470,050
Claims priority, application Japan, June 2, 1973, 48-62122
Int. Cl.² C07C *61/38*
U.S. Cl. 260—468 D **5 Claims**

1. 13,14 ξ-Methylene-15-oxoprostanoic acid derivatives having the formula



wherein A represents a straight or branched alkylene group having from 4 to 8 carbon atoms, R^1 represents a straight or branched alkyl group having from 4 to 10 carbon atoms and R^2 represents hydrogen atom or a straight or branched alkyl group having from one to 6 carbon atoms and pharmaceutically acceptable salts thereof.

3,925,452

PROCESS FOR THE PRODUCTION OF ALLYL ACETATE

Wolfgang Swodenk, Odenthal-Globusch, and Gerhard Scharfe, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 15,700, March 2, 1970, abandoned. This application Feb. 7, 1973, Ser. No. 330,536
Claims priority, application Germany, Mar. 5, 1969, 1911178
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² C07C *67/04*
U.S. Cl. 260—497 A **12 Claims**

1. Process for the production of allyl acetate wherein propylene, oxygen and acetic acid are reacted in the gaseous phase and in the presence of a catalyst consisting essentially of palladium and alkali metal acetate and, optionally, a Group V to VIII metal, gold, or copper, or compounds thereof, which process comprises supplying the reactants at hourly rates of 1 to 3 moles of acetic acid per liter of catalyst, 1 to 5 moles of oxygen per mole of acetic acid, and 4 to 40 moles of propylene and inert components per mole of oxygen, and supplying water in the feed stream and controlling the ratio of said water to said acetic acid, within the range of 1 to 100 moles of water per mole of acetic acid to result in a conversion of more than 90 percent of the acetic acid introduced per pass.

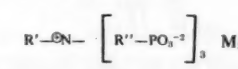
3,925,453

QUATERNARY AMINOALKYLENE PHOSPHONIC ACIDS AND METHOD OF PREPARATION

Fredric B. Clarke, III, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

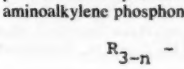
Filed Jan. 25, 1974, Ser. No. 436,417
Int. Cl.² C07F *9/38*
U.S. Cl. 260—501.12 **12 Claims**

1. Quaternary aminoalkylene phosphonic acids and salts thereof having the general formula

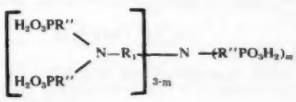


wherein R′ is alkyl of 1 to about 20 carbon atoms; R″ is alkylene or alkylidene of 1 to about 6 carbon atoms, and each M is individually hydrogen, alkali metal or ammonium ion.

6. A process for preparing quaternized aminoalkylene phosphonic acid compounds which comprises contacting a tertiary aminoalkylene phosphonic acid of the formula



or



wherein each R is individually an alkyl, cycloalkyl or aralkyl radical having from 1 to about 20 carbon atoms, R_1 is alkylene of from 2 to 8 carbon atoms, R″ is alkylene or alkylidene of 1 to about 6 carbon atoms, *n* is 1 to 3 and *m* is 1 or 2, with an alkylating agent of the formula R′—X wherein R′ is an alkyl or alkenyl group having from 1 to about 20 carbon atoms and X is halide, acetate, toluene sulfonate or benzene sulfonate in a polar organicsolvent and organic solvent the presence of a tertiary alkyl amine sufficiently hindered to inhibit quaternization thereof and having a pKa of from about 8 to about 11 at a temperature of from about 50°C. to about 250°C. for a time sufficient to achieve significant alkylation of the aminoalkylene phosphonic acid.

3,925,454

PREPARATION OF OPTICALLY ACTIVE ISOMERS OF LYSINES

Ichiro Chibata; Shigeki Yamada, both of Toyonaka, and Masao Yamamoto, Kyoto, all of Japan, assignors to Tanabe Seiyaku Co. Ltd., Osaka, Japan

Filed Apr. 17, 1969, Ser. No. 817,148

Claims priority, application Japan, Apr. 22, 1968, 43-27181; Apr. 22, 1968, 43-27182

Int. Cl.² C07C *143/00*

U.S. Cl. 260—501.12 14 Claims

1. A process for resolving DL-lysine-p-aminobenzenesulfonate comprising the steps of preparing a supersaturated solution of DL-lysine-p-aminobenzenesulfonate in an inert solvent selected from the group consisting of water, a mixture of water and a alkanone having up to 6 carbon atoms, a mixture of water and an alkanol having up to 6 carbon atoms, and an alkanol having up to 6 carbon atoms; adding crystals of the desired enantiomer of the DL-lysine-p-aminobenzenesulfonate to cause crystallization of the desired enantiomer to take place, and recovering the separated crystals.

3,925,455

HALOVINYLENE- 1,2-BIS(PHOSPHONIC ACIDS AND ESTERS)AND PROCESS FOR THEIR PREPARATION

Ludwig Maier, Kilchberg, Switzerland, assignor to Monsanto Company, St. Louis, Mo.

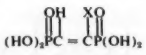
Division of Ser. No. 261,171, June 9, 1972, Pat. No. 3,789,092. This application Oct. 29, 1973, Ser. No. 410,651

Claims priority, application Switzerland, June 30, 1971, 9591/71

Int. Cl.² C07F *9/38*

U.S. Cl. 260—502.4 P 2 Claims

1. A halovinylene -1,2-bis(phosphonic acid) of the formula 8n



where X is selected from the group consisting of chlorine, bromine and iodine.

3,925,456

CYCLIC AMINOPHOSPHONIC ACIDS

Walter Ploger, Hilden Rhineland; Manfred Schmidt-Dunker, Dusseldorf, and Christian Gloxhuber, Haan Rhineland, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf, Germany

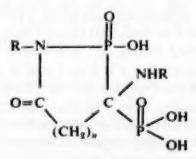
Filed Aug. 20, 1974, Ser. No. 498,996

Claims priority, application Germany, Aug. 27, 1973, 2343195

Int. Cl.² C07F *9/38*

U.S. Cl. 260—502.5 8 Claims

1. A cyclic aminophosphonic acid derivative selected from the group consisting of (1) compounds of the formula



wherein R is a member selected from the group consisting of hydrogen and alkyl having from 1 to 6 carbon atoms and *n* is an integer from 1 to 4, and (2) alkali metal or ammonium salts thereof.

3,925,457

SUBSTITUTED O-[4-(N-ALKYL-N-PHENYLAMINO)-2-HYDROXYBENZOYL]-BENZOIC ACID

Katsuhiko Tsunemitsu; Kanji Kiuchi; Yasushi Nakai; Hajime Kawai, and Shimpei Yamada, all of Kyoto, Japan, assignors to Yamada Kagaku Kenkyusho Co., Ltd., Japan

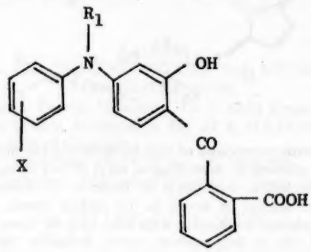
Division of Ser. No. 319,026, Dec. 27, 1972. This application Sept. 9, 1974, Ser. No. 504,078

Claims priority, application Japan, Dec. 27, 1971, 46-311

Int. Cl.² C07C *101/78*

U.S. Cl. 260—517 4 Claims

1. A compound of the formula



wherein X is hydrogen, halogen or alkyl of 1–5 carbon atoms and R_1 is alkyl of 1–5 carbon atoms.

3,925,458

PROCESS FOR PREPARING 2-(4-ALKYLPHENYL)-PROPION-ALDEHYDE AND PROPIONIC ACID

Katsura Kogure, and Kunio Nakagawa, both of Kawagoe, Japan, assignors to Nisshin Flour Milling Co., Ltd., Tokyo, Japan

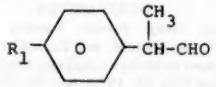
Filed Jan. 25, 1974, Ser. No. 436,634

Claims priority, application Japan, Jan. 29, 1973, 48-11166

Int. Cl.² C07C *51/26*, *47/48*

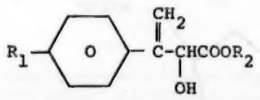
U.S. Cl. 260—523 A 10 Claims

1. A process for preparing a 2-(4-alkylphenyl)propionaldehyde of the formula



wherein R_1 is alkyl of 2–4 carbon atoms, which comprises reacting:

a. a 2-hydroxy-3-(4-alkylphenyl)-3-butenoic acid or ester of the formula



wherein R has the above-identified values and R is alkyl of 1–3 carbon atoms, hydrogen or an alkali metal cation, with

b. a mineral acid at a reaction temperature of 80°–100°C. to form said propionaldehyde.

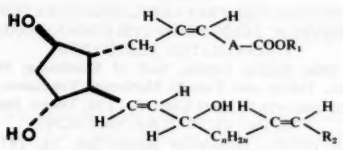
10. A process according to claim 2 further comprising oxidizing the 2-(4-alkylphenyl)-propionaldehyde product to form the corresponding 2-(4-alkylphenyl)-propionic acid or a salt thereof.

3,925,459
PGF$_{3\beta}$ ANALOGS

Udo F. Axen, Comstock Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 112,032, Feb. 2, 1971, Pat. No. 3,775,462, which is a continuation-in-part of Ser. No. 30,312, April 20, 1970, abandoned. This application Nov. 5, 1973, Ser. No. 412,801
Int. Cl.[2] C07C *61/38, 69/74*
U.S. Cl. 260—468 D 13 Claims

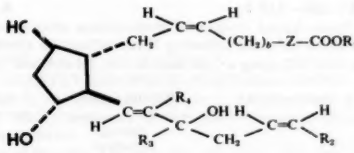
1. A racemic mixture of a compound of the formula:



and its mirror image, wherein R_1 is hydrogen, alkyl of one to 8 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one to 3 chloro or alkyl of one to 4 carbon atoms, inclusive, or β,β,β-trichloroethyl; wherein R_2 is alkyl of one to 4 carbon atoms, inclusive, substituted with zero to 3 fluoro; wherein n is an integer of one to 4, inclusive; wherein A is alkylene of one to 10 carbon atoms, inclusive, substituted with zero to 2 fluoro, and with one to 5 carbon atoms, inclusive, between $-COOR_1$ and

or a pharmacologically acceptable salt thereof when R_1 is hydrogen.

8. An optically active compound of the formula:



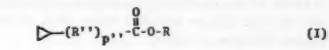
or a racemic compound of that formula and the mirror image thereof, wherein R_1 is hydrogen, alkyl of one to 8 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive, or β,β,β-trichloroethyl; wherein R_2 is alkyl of one to 4 carbon atoms, inclusive, substituted with zero to 3 fluoro; wherein R_3 and R_4 are hydrogen or alkyl of one to 4 carbon atoms, inclusive; wherein Z is ethylene substituted by one or 2 fluoro; wherein *b* is zero, one, 2, or 3; or a pharmacologically acceptable salt thereof when R_1 is hydrogen.

3,925,460
ESTERS OF CYCLOPROPANE SUBSTITUTED CARBOXYLIC ACIDS

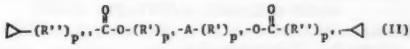
Clive A. Henrick, and Gerardus B. Staal, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. Nos. 413,958, Nov. 8, 1973, Ser. No. 367,058, June 4, 1973, abandoned, Ser. No. 390,991, Aug. 23, 1973, abandoned, Ser. No. 350,952, April 13, 1973, Pat. No. 3,849,466, and Ser. No. 351,028, April 13, 1973, Pat. No. 3,860,629. This application Apr. 12, 1974, Ser. No. 461,189
Int. Cl.[2] C07C *69/74*
U.S. Cl. 260—468 H 50 Claims

1. Compounds selected from those of the formula I or II:



(I)



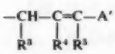
(II)

wherein,

R'' is —CH=CH— or $-(CH_2)_n-$ in which *n* is a positive number from one to four;

p'' is 0 or 1;

R is alkyl of 10 to 22 carbon atoms, alkenyl of 10 to 22 carbon atoms and having one to three sites of olefinic unsaturation, alkynyl of ten to twenty-two carbon atoms and having one or two sites of acetylenic unsaturation or the group



in which A' is phenyl, naphthyl or cycloalkyl of 4 to 8 carbon atoms, each ring being optionally substituted by one or more halogen, alkyl of 1 to 22 carbon atoms, alkoxy of 1 to 15 carbon atoms, aryl of 6 to 14 carbon atoms, aralkyl of 7 to 15 carbon atoms, aryloxy of 6 to 14 carbon atoms or aralkoxy of 7 to 15 carbon atoms groups, and each of R^3, R^4 and R^5 is hydrogen or lower alkyl;

p' is 0 or 1;

R' is alkylene of 1 to 6 carbon atoms or alkenylene of 2 to 6 carbon atoms; and

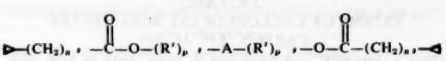
A is alkylene of 2 to 20 carbon atoms, alkenylene of 2 to 20 carbon atoms and having one to three sites of olefinic unsaturation, alkynylene of 2 to 20 carbon atoms and having one or two sites of acetylenic unsaturation, arylene of 6 to 20 carbon atoms optionally substituted by one or two groups selected from alkyl of 1 to 22 carbon atoms, halogen or nitro, or cycloalkylene of 4 to 6 carbon atoms optionally substituted by one or two alkyl groups of 1 to 22 carbon atoms or one or two alkoxy groups of 1 to 15 carbon atoms.

3,925,461
ESTERS OF CYCLOPROPANE ALKANOIC ACIDS

Clive A. Henrick, and Gerardus B. Staal, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Filed July 17, 1974, Ser. No. 489,205
Int. Cl.[2] C07C *61/04, 69/74*
U.S. Cl. 260—468 H 9 Claims

1. Compounds of the formula



wherein,

n' is the even integer 6, 8 or 10;

R' is alkylene of one to six carbon atoms or alkenylene of two to six carbon atoms;

p' is zero or one; and

A is alkylene of one to 10 carbon atoms; alkenylene of two to ten carbon atoms; alkynylene of two to 10 carbon atoms; cycloalkylene of four to six carbon atoms, optionally substituted by one or two alkyl groups of one to 20 carbon atoms or one or two alkoxy groups of one to 15 carbon atoms; or arylene of six to 20 carbon atoms, optionally substituted by one or two groups selected from alkyl of one to 20 carbon atoms, halogen or nitro.

3,925,462
WASH-DURABLE ANTISTATIC AGENT

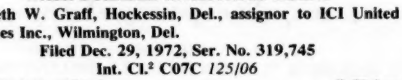
Kenneth W. Graff, Hockessin, Del., assignor to ICI United States Inc., Wilmington, Del.

Filed Dec. 29, 1972, Ser. No. 319,745

Int. Cl.² C07C *125/06*

U.S. Cl. 260—471 C **7 Claims**

1. A composition consisting essentially of the reaction product of (a) an organic aromatic polyisocyanate containing at least 2 NCO groups directly attached to the carbon atoms of an aromatic ring, (b) a thermally reversible blocking agent selected from the group consisting of phenol, lower alkyl substituted phenols, and mixtures thereof, and (c) a cationic surfactant represented by the formula



wherein n represents an integer from 2 to 4, x represents a number from 0 to 100, y represents a number from 0 to 100, R represents a radical selected from the group consisting of alkyl and alkenyl radicals containing from 6 to 22 carbon atoms, R' represents a radical selected from the group consisting of alkyl and hydroxyalkyl radicals containing from 1 to 5 carbon atoms, and X represents an anion said reaction being carried out at a temperature up to 200°C. and the amounts of organic aromatic polyisocyanate, thermally reversible blocking agent, and cationic surfactant are selected to furnish a ratio of mols of blocking agent to NCO groups present in the aromatic polyisocyanate of less than 1 and a number of NCO groups of not more than the sum of the hydroxyl groups of the cationic surfactant and mols of blocking agent.

3,925,463
PROCESS FOR THE PRODUCTION OF METHYL ACRYLATE

Natale Ferlazzo, Milan; Gian Fausto Buzzi, Novara, and Marcello Ghirga, Milan, all of Italy, assignors to Societa Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Nov. 29, 1973, Ser. No. 420,352

Claims priority, application Italy, Nov. 30, 1972, 32279/72

Int. Cl.² C07C *69/54*

U.S. Cl. 260—486 R **16 Claims**

1. Process for the production of methyl acrylate, which consists of contacting a gaseous stream containing at least one unsaturated compound selected from the group consisting of propylene and acrolein together with methanol and an oxidizing agent selected from the group consisting of molecular oxygen and gases containing molecular oxygen with an oxidation catalyst selected from the group comprising:

mixtures of antimony and tin oxides containing compounds of iron, vanadium and/or tungsten, or

mixtures of oxides of molybdenum and cobalt, optionally activated with tellurium compounds,

wherein the molar ratio of the unsaturated compound or compounds to oxygen is in the range of from about 0.1/1 to 1/1, while the molar ratio of the unsaturated compound to methanol is in the range of from about 0.5/1 to 2/1 and wherein the operation is carried out at a temperature in the range of from about 200° to 450°C., at a pressure of from about 1 to 5 atmospheres and wherein a contact time of from 0.1 to 10 seconds is employed and subsequently recovering methyl acrylate from the gaseous reaction products.

3,925,464
PROCESS FOR PREPARING UNSATURATED CARBOXYLIC ACIDS FROM THE CORRESPONDING UNSATURATED ALDEHYDES

Yoshio Oda; Keiichi Uchida, both of Yokohama; Manabu Suhara, Tokyo, and Takeshi Morimoto, Yokohama, all of Japan, assignors to Asahi Glass Co., Ltd, Tokyo, Japan

Filed Dec. 12, 1972, Ser. No. 314,397

Claims priority, application Japan, Dec. 14, 1971, 46-100718; Feb. 25, 1972, 47-18877

Int. Cl.² C07C *51/26*

U.S. Cl. 260—530 N **16 Claims**

1. The process for preparing acrylic acid or methacrylic acid which comprises reacting acrolein or methacrolein with molecular oxygen in the vapor phase at a temperature from 250° to 450°C, in the presence of a catalyst having the empirical formula: $Mo_{12}—P_{\alpha}—X_{\beta}—Y_{\gamma}—O_{\delta}$ wherein X is at least one element selected from the group consisting of tungsten and magnesium; Y is at least one element selected from the group consisting of vanadium and bismuth; α is a number from 0.1 to 5; β is a number 0.1 to 10; γ is a number from 0.1 to 10, and δ is a number from 37 to 131.

3,925,465
CRYSTALLIZATION OF ALPHA MONOSODIUM CITRATE MONOHYDRATE

Kiyoshi Nara, Kyoto; Kazuyoshi Katamoto, Osaka; Kazuhiko Ohta, Osaka, and Hideo Fukuda, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

Filed Apr. 25, 1974, Ser. No. 464,614

Claims priority, application Japan, May 26, 1973, 48-47890; Dec. 7, 1973, 48-137112

Int. Cl.² C07C *59/16*

U.S. Cl. 260—535 P **4 Claims**

1. Prism-shaped crystals of monosodium citrate monohydrate which have the following X-ray diffraction characteristics at λ=1.542 using a CuK-line, 40 KV, 80 mA and Ni-filter:

Spacing d (A)	Relative intensities
7.8	Strong
6.4	Medium
5.4	Medium
4.1	Weak
4.0	Weak
3.89	Very Strong
3.79	Very Weak
3.71	Medium
3.58	Weak
3.49	Medium
3.35	Weak
3.30	Weak
3.25	Very Weak
3.18	Medium
2.92	Weak
2.77	Very Weak
2.70	Weak
2.60	Weak
2.55	Weak
2.45	Very Weak
2.42	Medium
2.36	Very Weak
2.34	Weak
2.29	Weak.

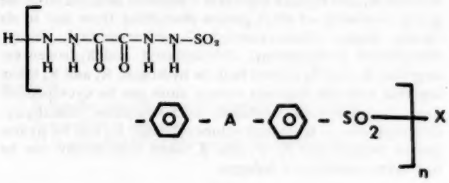
3,925,466

REACTION PRODUCT OF OXALYLDIHYDRAZIDE AND BIS(SULFONYL HALIDE)

Byron A. Hunter, Woodbridge, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 354,819, April 26, 1973, abandoned. This application May 8, 1974, Ser. No. 468,060
Int. Cl.² C07C *143/70*
U.S. Cl. 260—543 R 2 Claims

1. An oligomer having the general formula:



where *n* is a number from 1 to 100, X is chlorine, bromine or iodine, and A is a single bond, or a radical selected from the group consisting of oxygen, sulfur, sulfoxide, sulfone, and alkylene of 2 to 6 carbon atoms, an alkylidene of 2 to 6 carbon atoms, and an oxydialkylene of 4 to 12 carbon atoms.

3,925,467

1,5-DIOXO-2,4,6,8,9,11-HEXAKIS (METHYLIMIDA)-1,5-IPHOSPHABICYCLO[3,3,3]UNDECANE

Charles W. Heitsch, Webster Groves, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 331,935, Feb. 12, 1973, abandoned. This application Oct. 21, 1974, Ser. No. 516,515
Int. Cl.² C07F *9/44*
U.S. Cl. 260—551 P 2 Claims

1. 1,5-dioxo-2,4,6,8,9,11-hexakis (methylimida)-1,5-diphosphabicyclo[3.3.3]-undecane.

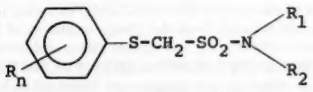
3,925,468

1-(ARYLTHIO) METHANESULFONAMIDES

Christian T. Goralski, and Thomas C. Klingler, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 314,793, Dec. 13, 1972. This application July 10, 1974, Ser. No. 487,111
Int. Cl.² C07C *149/425*
U.S. Cl. 260—556 A 3 Claims

1. A 1-(arylthio)methanesulfonamide corresponding to the formula



wherein R represents H, lower alkyl, lower alkoxy, halo or trifluoromethyl, *n* represents an integer from 0 to 3 and R_1 and R_2 independently represent H, lower alkyl or phenyl at least one of which is phenyl.

3,925,469

TERTIARY-ALKYLAMINO-LOWER-ACYL-XYLIDIDE LOCAL ANAESTHETICS

Herbert H. F. Adams, Westboro; Jon C. Anderson, Wyckoff, both of N.J.; Murray R. Blair, Jr., Sudbury, Mass.; Robert L. DiRubio, Paxton, Mass., and Bertil H. Takman, Worcester, Mass., assignors to Astra Pharmaceutical Products, Inc., Worcester, Mass.

Continuation-in-part of Ser. Nos. 230,114, Feb. 28, 1972, abandoned, and Ser. No. 325,378, Jan. 22, 1973, abandoned. This application June 12, 1973, Ser. No. 369,146
Int. Cl.² C07C *103/34*
U.S. Cl. 260—562 B 4 Claims

1. A local anesthetic compound selected from the group consisting of 2-(N-ethyl-tert.-amylamino)-2′,6′-acetoxylidide and a pharmaceutically acceptable salt thereof.

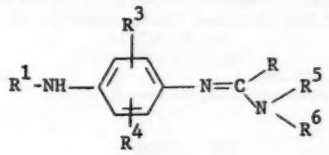
3,925,470

AMINOPHENYLAMIDINES, THEIR PRODUCTION AND THEIR MEDICINAL USE

Hartmund Wollweber, Wuppertal, Germany, and Winfried Flucke, Beenleigh, Australia, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 399,813, Sept. 24, 1973, which is a division of Ser. No. 151,575, June 9, 1971, Pat. No. 3,855,292. This application Oct. 17, 1974, Ser. No. 515,626
Claims priority, application Germany, June 13, 1970, 2029299
Int. Cl.² C07C *123/00*
U.S. Cl. 260—564 RF 3 Claims

1. A compound of the formula:



wherein

R^1 is hydrogen, alkyl of 1 to 5 carbon atoms, alkoxyalkyl of 2 to 5 carbon atoms or alkenyl of 2 to 5 carbon atoms;

each of R^3 and R^4, independently of the other, is alkenyl of 2 to 6 carbon atoms, or one is hydrogen and the other is alkenyl of 2 to 6 carbon atoms;

R is alkyl of 1 to 5 carbon atoms;

R^5 is alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms, alkynyl of 2 to 4 carbon atoms, or cycloalkyl of 3 to 6 carbon atoms; and

R^6 is hydrogen, alkyl of 1 to 5 carbon atoms or alkenyl of 2 to 5 carbon atoms;

or a salt thereof of a pharmaceutically acceptable acid.

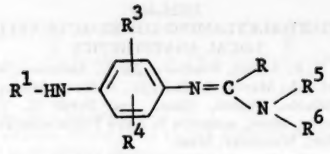
3,925,471

AMINOPHENYLAMIDINES THEIR PRODUCTION AND THEIR MEDICINAL USE

Hartmund Wollweber, Wuppertal-Elberfeld, Germany, and Winfried Flucke, Beenleigh, Australia, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 399,813, Sept. 24, 1973, which is a division of Ser. No. 151,575, June 9, 1971, Pat. No. 3,855,292. This application Oct. 17, 1974, Ser. No. 515,627
Claims priority, application Germany, June 13, 1970, 2029299
Int. Cl.² C07C *123/00*
U.S. Cl. 260—564 RF 3 Claims

1. A compound of the formula:



wherein

R^1 is hydrogen, alkyl of 1 to 5 carbon atoms, alkoxyalkyl of 2 to 5 carbon atoms or alkenyl of 2 to 5 carbon atoms;

each of R^3 and R^4, independently of the other, is alkoxy of 1 to 6 carbon atoms, or one is hydrogen and the other is alkoxy of 1 to 6 carbon atoms;

R is alkyl of 1 to 5 carbon atoms;

R^5 is alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms, alkynyl of 2 to 4 carbon atoms, or cycloalkyl of 3 to 6 carbon atoms; and

R^6 is hydrogen, alkyl of 1 to 5 carbon atoms or alkenyl of 2 to 5 carbon atoms;

or a salt thereof of a pharmaceutically acceptable acid.

3,925,472

PHENOLIC OXIMES

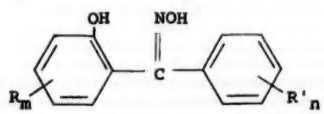
Ronald R. Swanson, New Hope, Minn., assignor to General Mills Chemicals, Inc., Minneapolis, Minn.

Continuation of Ser. No. 709,801, Mar. 1, 1968, abandoned, which is a continuation-in-part of Ser. No. 498,121, Oct. 19, 1965, abandoned. This application Nov. 21, 1973, Ser. No. 417,915

Int. Cl.² C07C *131/00*

U.S. Cl. 260—566 A **14 Claims**

1. A compound having the formula:



in which R and R′ may be individually alike or different and are saturated aliphatic hydrocarbon groups of 1–25 carbon atoms, *m* and *n* are 0, 1, 2, 3 or 4 with the proviso that both are not 0 and the total number of carbon atoms in R_m and R'_n is from 3–25, said compound being further characterized as being substantially insoluble in water, having a solubility of at least 2% by weight in benzene and forming a complex with copper which complex is also soluble to the extent of at least 2% by weight in benzene.

3,925,473

HERBICIDAL OXIME ESTERS OF PHENOXYALKANOIC ESTERS AND THEIR USE AS SELECTIVE HERBICIDES

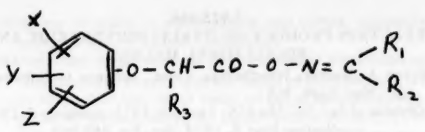
Ludwig Nusslein, and Friedrich Arndt, both of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

Filed Dec. 12, 1973, Ser. No. 424,005

Int. Cl.² C07C *131/00*

U.S. Cl. 260—566 AE **3 Claims**

1. A compound of the formula



wherein R_1 and R_2 each represent a member selected from the group consisting of alkyl groups containing from one to six carbon atoms, phenoxymethyl, 2-methoxymethyl, phenyl, nitrophenyl, methylphenyl, chlorophenyl, and hydrogen except that R_1 and R_2 cannot both be hydrogen; R_1 and R_2 taken together with the adjacent carbon atom can be cyclopentylidene, 3-methylcyclopentylidene, cyclohexlidene, dimethylcyclohexylidene or trimethylcyclohexylidene; R_3 can be hydrogen or methyl and X, Y, and Z taken individually can be hydrogen, methyl or a halogen.

3,925,474

NITROPARAPHENYLENE DIAMINE DERIVATIVES AND METHODS OF MAKING THEM

Gregoire Kalopissis, Paris; Andree Bugaut, Boulogne-sur-Seine, and Vahan Zorayan, Enghien-les-Bains, all of France, assignors to L'Oreal, Paris, France

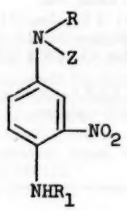
Division of Ser. No. 729,499, May 16, 1968, Pat. No. 3,694,140. This application Dec. 15, 1971, Ser. No. 208,490

Claims priority, application France, May 16, 1967, 53676

Int. Cl.² C07C *87/14*

U.S. Cl. 260—570.5 P **3 Claims**

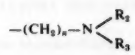
1. A method for preparing a compound of the formula



in which R is selected from the group consisting of hydrogen, lower alkyl having 1–6 carbon atoms, amino-alkyl having 1–6 carbon atoms, amino dialkyl wherein each of the alkyl moieties has 1–6 carbon atoms and alkylaminodialkyl wherein each of the alkyl moieties has 1–6 carbon atoms,

Z is hydrogen, and

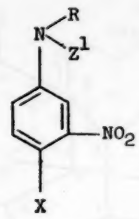
R_1 is



in which

n is a whole number between 2 and 6 inclusive and R_2 and R_3 are selected from the group consisting of hydrogen, lower alkyl having 1–6 carbon atoms and lower hydroxyalkyl having 1–6 carbon atoms, with the proviso that R is other than hydrogen and lower alkyl having 1–6 carbon atoms when R_2 and R_3 are both lower alkyl having 1–6 carbon atoms, which method comprises the steps of

reacting an amine of the formula $R_1—NH_2$, in which R_1 has the significance hereinbefore indicated, with a compound of the formula

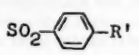


in which

R has the significance hereinbefore indicated,

X represents halogen,

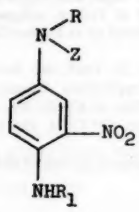
Z^1 is selected from the group consisting of



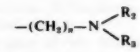
and OC—R'' in which R' is selected from the group consisting of hydrogen, methyl and NO_2 and R'' is lower alkyl having 1–6 carbon atoms and acid hydrolyzing the resulting product to yield said compound.

2. A compound selected from the group consisting of

a. a compound of the formula



in which R is selected from the group consisting of hydrogen, alkyl having 1–6 carbon atoms, amino-alkyl having 1–6 carbon atoms, amino dialkyl wherein each of the alkyl moieties has 1–6 carbon atoms and alkyl amino-dialkyl wherein each of the alkyl moieties has 1–6 carbon atoms, Z is hydrogen, and R_1 represents



in which *n* is a whole number between 2 and 6 and R_2 and R_3 are selected from the group consisting of hydrogen, lower alkyl having 1–6 carbon atoms and lower hydroxyalkyl having 1–6 carbon atoms, with the proviso that R is other than hydrogen and lower alkyl having 1–6 carbon atoms when R_2 and R_3 are both lower alkyl having 1–6 carbon atoms and

b. the quaternized compound of (a).

3,925,475

N-VINYL OXYETHYL-α-METHYL-β-PHENETHYLAMINES

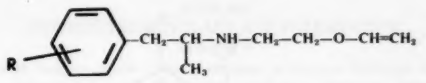
Bruce Wayne Horrom, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 481,626, June 21, 1974, abandoned. This application Aug. 16, 1974, Ser. No. 498,013

Int. Cl.² C07C *87/29*

U.S. Cl. 260—570.8 R **6 Claims**

1. A compound of the formula



wherein R is hydrogen, halo or trifluoromethyl, and acid addition salts thereof.

3,925,476

10-(2-DIALKYLAMINOETHYL)-10,11-DIHYDRO, OR 10-(2-DIALKYLAMINOETHYL)-5-METHYLENE-2,7-SUBSTITUTED OR UNSUBSTITUTED-5H-DIBENZO[A,D]CYCLOHEPTENES

William J. Houlihan, Mountain Lakes, N.J., and Jeffrey Nadelson, Lake Parsippany, N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

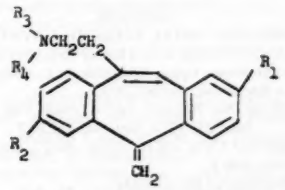
Filed Feb. 7, 1972, Ser. No. 224,323

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C07C *87/29*

U.S. Cl. 260—570.8 TC **3 Claims**

1. A compound having the formula



wherein

R_1 and R_2 are independently hydrogen, lower alkyl having 1 to 3 carbon atoms, lower alkoxy having 1 to 3 carbons atoms, halo having an atomic weight of 19 to 36 or trifluoromethyl,

R_3 and R_4 are independently lower alkyl having 1 to 3 carbon atoms.

2. A pharmaceutically acceptable acid addition salt of a compound of claim 1.

3,925,477

TRICYCLO[5,3,1,$0^{3,8}$]UNDECAN-2-ONES AND THE CORRESPONDING MONO- AND DI-UNSATURATED DERIVATIVES

Georg Frater, Greifensee; Hans Greuter, Horgen, and Hans Schmid, Schwerzenbach, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

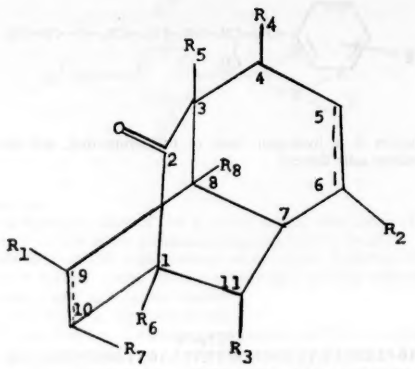
Division of Ser. No. 300,603, Oct. 25, 1972, Pat. No. 3,836,584. This application June 10, 1974, Ser. No. 477,865

Claims priority, application Switzerland, Nov. 12, 1971, 16517/71

Int. Cl.² C07C *49/54*

U.S. Cl. 260—586 G **8 Claims**

1. A compound selected from the group consisting of tricyclic ketones of the formula:



wherein R_1, R_7 and R_8 are independently selected from the group consisting of lower alkyl, hydrogen and lower alkoxy; R_2 is a hydrogen atom, lower alkyl or lower alkenyl; R_3 and R_4 are independently selected from the group consisting of hydrogen or lower alkyl; R_5 and R_6 are independently lower alkyl; and wherein the dotted bond represents a single or double bond.

3,925,478

STEREOSPECIFIC TOTAL STEROIDAL SYNTHESIS VIA SUBSTITUTED C/D-TRANS INDANONES

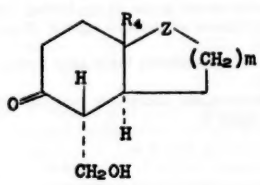
Zoltan George Hajos, Upper Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 765,023, Oct. 4, 1968. This application June 24, 1974, Ser. No. 482,822

Int. Cl.² C07C *49/36, 49/38, 49/27, 43/18*

U.S. Cl. 260—586 F **4 Claims**

1. A compound of the formula



wherein

R_4 is hydrogen or lower alkyl; Z is carbonyl, lower alkylenedioxy or $CH(OR_2)$; *m* is an integer having the value of 1 or 2 and R_2 is hydrogen, lower alkyl, lower alkoxy-lower alkyl, phenyl-lower alkyl, tetrahydropyranyl, lower alkanoyl, benzoyl, nitrobenzoyl, carboxylower alkanoyl, carboxy-benzoyl, trifluroacetyl, or camphorsulfonyl.

3,925,479

TRICYCLO (5,4,0,$0^{3,9}$)UNDECAN-2-ONES

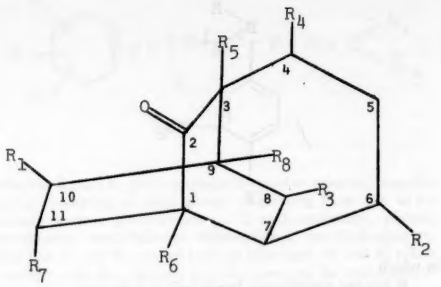
Georg Frater, Greifensee; Hans Greuter, Horgen, and Hans Schmid, Schwerzenbach, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 300,603, Oct. 25, 1972, Pat. No. 3,836,584. This application Apr. 12, 1974, Ser. No. 460,395

Int. Cl.² C07C *49/36, 49/54*

U.S. Cl. 260—586 G **5 Claims**

1. A compound of the formula:



wherein R_1, R_7 and R_8 are independently selected from the group consisting of lower alkyl, hydrogen and lower alkoxy; R_2 is a hydrogen atom, lower alkyl or lower alkenyl; R_3 and R_4 are independently selected from the group consisting of hydrogen or lower alkyl; R_5 and R_6 are independently lower alkyl.

3,925,480

NOVEL 16,17α AND 17,17α DIKETO-D-HOMOSTEROIDS AND THEIR METHOD OF PREPARATION

Bernard Gastambide, Reims; Claude Thal, Gif-sur-Yvette; Philippe Rohrbach, Paris, and Marie-Jeanne Laroche, Nogent-sur-Marne, all of France, assignors to Etablissement Public: Centre National de la Recherche Scientifique, Paris, France

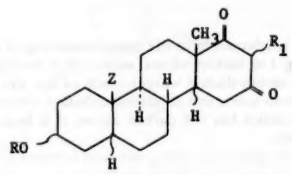
Filed Mar. 23, 1967, Ser. No. 625,312

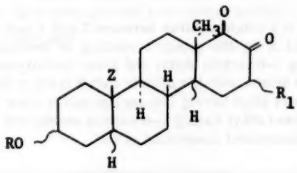
Claims priority, application France, Mar. 31, 1966, 66.55903; June 27, 1966, 66.67026; Mar. 6, 1967, 67.97572

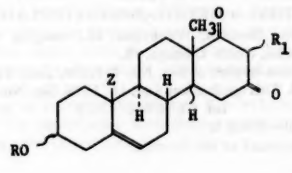
Int. Cl.² C07C *49/48*

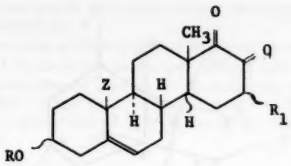
U.S. Cl. 260—586 E **9 Claims**

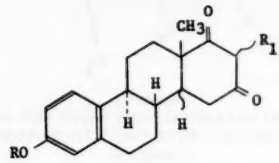
1. Diketo-D-homosteroid of one of the formulae

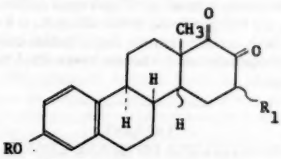












wherein each of

R and R_1 is, independently, a member selected from the group consisting of a hydrogen atom and lower alkyl; and Z is a member selected from the group consisting of a hydrogen atom and methyl.

3,925,481

PROCESS AND CATALYST FOR THE PREPARATION OF KETONES AND/OR ALDEHYDES FROM OLEFINES

John W. Geus, Geleen, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Continuation-in-part of Ser. Nos. 765,651, Nov. 7, 1968, abandoned, and Ser. No. 108,081, Jan. 20, 1971, abandoned. This application July 20, 1972, Ser. No. 273,428

Claims priority, application Netherlands, Apr. 18, 1970, 7005647

Int. Cl.² C07C *45/02*

U.S. Cl. 260—597 R **8 Claims**

1. In a process for preparing ketones wherein an alkene containing up to 4 carbon atoms and an oxidizing agent are passed at an elevated temperature over a supported catalyst, the improvement consisting essentially in reacting said alkene together with both molecular oxygen and steam in a combined amount in excess of the quantity of said alkene in the presence of a catalyst system containing finely divided discrete tin oxide particles, a majority of which are of a size of at most 50 A units, homogeneously distributed over a solid particulate, inorganic, thermally stable supporting material, and having a substantially monomolecular layer of molybdenum oxide deposited over said discrete tin oxide particles, said reaction being carried out at an average catalyst surface temperature within the range of between 100°C to about 350°C.

3,925,482

DISUBSTITUTED TOLANS AND PREPARATION THEREOF

Jean Jacques, Paris, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Hauts de Seine, France

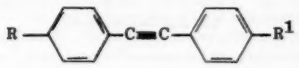
Filed June 1, 1972, Ser. No. 258,859

Claims priority, application France, June 2, 1971, 71.19929; Nov. 19, 1971, 71.41515

Int. Cl.² C07C *43/20, 43/22*

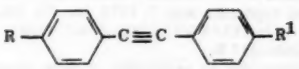
U.S. Cl. 260—612 R **17 Claims**

1. A tolan of the formula



wherein R and R^1 are unlike alkoxy groups, wherein each of R and R^1 has at least 1 but less than 11 carbon atoms and the total number of the carbon atoms in R and R^1 is more than 9 and less than 13.

2. A tolan of the formula



wherein R is an n-alkyl group and R^1 is an n-alkoxy group, wherein each of R and R^1 has at least 1 but less than 11 carbon atoms and the total number of the carbon atoms in R and R^1 is more than 3 but less than 13.

3,925,483

α-(P-BENZYLOXYPHENYL)-P-CRESOL

Mario Gustav Buzzolini, Morristown, and Robert Everett Manning, Mountain Lakes, both of N.J., assignors to Sandoz-Wander, Inc., E. Hanover, N.J.

Division of Ser. No. 258,787, June 1, 1972. This application Feb. 15, 1974, Ser. No. 442,919

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C07C *43/20*

U.S. Cl. 260—613 R **1 Claim**

1. The phenolic compound which is α-(p-benzyloxyphenyl)-p-cresol.

3,925,484

PROCESS FOR MAKING POLYTETRAMETHYLENE ETHER GLYCOL HAVING A NARROW MOLECULAR WEICHT DISTRIBUTION

Melvin C. Baker, Youngstown, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 8, 1973, Ser. No. 414,129

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C07C *41/00*

U.S. Cl. 260—615 B **4 Claims**

1. A process for producing polytetramehylene ether glycol having a narrow molecular weight distribution of about 1.30–1.70, a number average molecular weight of about 1600–3200 and a viscosity of about **4.0–20** poise at **40°C.**, said process comprising the steps of **(1)** partially depolymerizing at a temperature from about **120°–150°C.** polytetramethylene ether glycol starting material having a number average molecular weight of about **600–2200** in the presence of a cross-linked ion exchange resin in acid form to produce tetrahydrofuran and removing the tetrahydrofuran by vaporization as formed said depolymerization being conducted to an extent sufficient to obtain said narrow molecular weight distribution

polytetramethylene ether glycol and said resin being present at about 3–7 percent based upon the weight of starting polytetramethylene ether glycol, (2) cooling to about 70°–90°C., (3) filtering the polytetramethylene ether glycol to remove the resin therefrom, and (4) removing any remaining tetrahydrofuran at a low pressure of about 1–100 mm. of mercury.

4. A narrow molecular weight distribution polytetramethylene ether glycol having a molecular weight distribution of about 1.30 to 1.40, a number average molecular weight of about 1600–3200 and a viscosity of about 4.0–20 poise at 40°C.

3,925,485
PROCESS FOR THE PREPARATION OF ALLYLIC ALCOHOLS

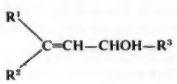
Pierre Chabardes; Charles Grard, both of Lyon, and Charles Schneider, Vernaison, all of France, assignors to Rhone-Poulenc S.A., Paris, France

Continuation of Ser. No. 888,934, Dec. 29, 1969, abandoned. This application Sept. 7, 1972, Ser. No. 286,889

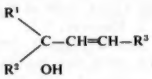
Int. Cl.² C07C *33/02, 69/61, 41/00*

U.S. Cl. 260—617 R **8 Claims**

1. A process for the preparation of allylic primary or secondary alcohols of the formulae:



and the tautomers thereof, comprising the step of heating in the liquid phase an ethylenic tertiary alcohol of the formulae:



in the presence of a transition metal catalyst selected from the group consisting of compounds of vanadium, niobium molybdenum, tungsten and rhenium, and wherein R^1 and R^2 are selected from the group consisting of alkyl, non-conjugated alkenyl and alkadienyl, cyclo-alkyl of 3 – 10 carbons, carbocyclic arylakyl and carbocyclic aromatic groups, and wherein R^1 and R^2 together may represent an alkylene or alkenylene of 4 to 7 carbons in the starting material, and together form a 1-cycloalkenylene of 5 to 8 carbons in the alcohol product, and wherein R^1 and R^2 may be substituted by halogen, hydroxy, alkoxy, alkanoyl or alkanoyloxy, and R^3 may be the same as R^1 and R^2, individually, or hydrogen.

3,925,486
POLYCYCLIC ALCOHOLS

Hans Greuter, Horgen; Georg Frater, Greifensee, and Hans Schmid, Schwerzenbach, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

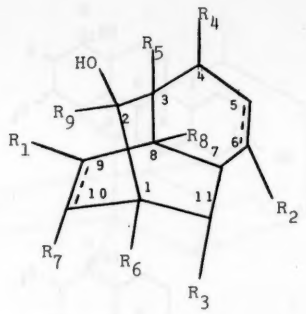
Filed Nov. 7, 1972, Ser. No. 304,402

Claims priority, application Switzerland, Nov. 12, 1971, 16518/71; Mar. 10, 1972, 3563/72; July 26, 1972, 11146/72

Int. Cl.² C07C *35/22*

U.S. Cl. 260—617 F **11 Claims**

1. A compound of the formula:



wherein R_1, R_7 and R_8 are independently selected from the group consisting of hydrogen, or lower alkyl; R_2 is hydrogen, or lower alkyl; R_3 and R_4 are independently selected from the group consisting of hydrogen or lower alkyl; R_5 and R_6 are independently lower alkyl; R_9 is hydrogen, or lower alkyl; and wherein the dotted bonds can be optionally hydrogenated and wherein lower alkyl has 1–6 carbon atoms.

3,925,487
SUBSTITUTED DIPHENYL ETHENE

Bernt Borretzen; Knut Gunnar Olsson, and Bertil Sundbeck, all of Malmo, Sweden, assignors to AB Ferrosan, Malmo, Sweden

Filed Dec. 22, 1969, Ser. No. 887,335

Claims priority, application United Kingdom, Dec. 24, 1968, 61474/68

Int. Cl.² C07C *39/12*

U.S. Cl. 260—619 A **1 Claim**

1. The compound bis(p-hydroxyphenyl)-2-methyl-cyclohex-4-enylidene methane.

3,925,488
PROCESS FOR THE PRODUCTION OF 1,3,5-TRIMETHY-2,4,6-TRIS(3,5-DI-TERT-ALKYL-4-HYDROXYBENZYL)BENZENE

Kju Hi Shin, Bloomfield Hills, Mich., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 146,538, May 24, 1971, abandoned. This application Mar. 1, 1974, Ser. No. 447,315

Int. Cl.² C07C *37/00*

U.S. Cl. 260—619 B **8 Claims**

1. In a process for making 1,3,5-tri-methyl-2,4,6-tris(3,5-di-tert-alkyl-4-hydroxybenzyl) benzene, said process comprising reacting 3,5-di-tert-alkyl-4-hydroxybenzyl alcohol with mesitylene in the presence of an acid catalyst, the improvement whereby dealkylation is reduced and increased yields are obtained, said improvement comprising (a) conducting said process in a substantially inert water-immiscible solvent having a normal boiling point of from about 30°–100°C, said process being carried out at the boiling point of the reaction mixture and distilling water formed during said process from said reaction mixture, (b) using as said acid catalyst a sulfonic acid selected from the group consisting of lower alkane sulfonic acids, halo-substituted lower alkane sulfonic acids and hydrocarbyl aromatic sulfonic acids, and (c) adding said 3,5-di-tert-alkyl-4-hydroxybenzyl alcohol over an extended time period to a boiling reaction mixture containing said mesitylene, said sulfonic acid catalyst and said inert solvent at a controlled rate such that the mole ratio of unreacted 3,5-di-tert-alkyl-4-hydroxybenzyl alcohol to original mesitylene in said boiling reaction mixture remains below about one mole

of said 3,5-di-tert-alkyl-4-hydroxybenzyl alcohol per mole of original mesitylene.

5. The process of claim 3 further improved by adding from about 0.05 to about 0.5 moles, per mole of said 3,5-di-tert-butyl-4-hydroxybenzyl alcohol, of formaldehyde to the process reaction mixture prior to the completion of the reaction of said 3,5-di-tert-butyl-4-hydroxybenzyl alcohol with said mesitylene.

3,925,489

METHOD FOR PRODUCING HYDRATES OF SODIUM CHLOROPHENATE AND HYDRATES PRODUCED THEREBY

Robert S. Cohen, Dover, and Lila J. Crites, Tuscarawas, both of Ohio, assignors to Dover Chemical Corporation, Dover, Ohio

Filed Apr. 15, 1968, Ser. No. 721,173

Int. Cl.² C07C *39/36, 39/24*

U.S. Cl. 260—623 R **10 Claims**

1. A process for forming water insoluble, sodium tri, tetra or penta chlorophenate hydrate from an aqueous solution containing a dissolved sodium chlorophenate selected from sodium tri, tetra and penta chlorophenate comprising establishing a sufficient quantity of dimethylsulfoxide in said solution such that, upon bringing the temperature of said solution to a point no greater than about 40°C at atmospheric pressure, said insoluble hydrate will form, and bringing the temperature of said solution to a point at which said insoluble hydrate comes into existence and precipitates from said solution.

3,925,490

HYDROGENATION CATALYSTS AND PROCESS FOR THE REMOVAL OF ALDEHYDES AND KETONES FROM GASEOUS STREAMS RICH IN CARBON MONOXIDE

Manfred Reich; Wolfgang Müller, and Manfred zur Hausen, all of Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft

Filed July 13, 1970, Ser. No. 54,589

Claims priority, application Germany, July 15, 1969, 1935900

Int. Cl.² C07C *29/14*

U.S. Cl. 260—643 B **11 Claims**

1. In a process for the removal of alkanals and alkanones having 3 to 8 carbon atoms from gaseous streams obtained in the Oxo process rich with about 5 to 95 percent by volume of hydrogen, about 5 to 60 percent by volume of carbon monoxide and about 5 to 60 grams of said alkanals and alkanones per cubic meter at normal conditions, the improvement comprising hydrogenating said aldehydes and ketones to alkanols at a temperature of about 100° to 200°C, a pressure of about 3 to 50 atmospheres and in the presence of a supported metal catalyst comprising 100 parts support material by weight, about 5 to 100 parts by weight of copper and about 0.5 to 50 percent by weight of chromium based on the weight of the copper, said supported metal catalyst is prepared by precipitating salts of the copper and chromium from solution, drying the precipitated material and reducing the salts in a hydrogen stream at an elevated temperature of about 100° to 300°C.

3,925,491

NEW FLUORINATED DIENES AND PROCESS FOR PREPARING SAME

Jean G. Riess; Maurice Le Blanc; Georges Santini, and Jacky Guion, all of Nice, France, assignors to Produits Chimiques Ugine Kuhlmann, Saint-Denis, France

Division of Ser. No. 446,101, Feb. 26, 1974, Pat. No. 3,901,948. This application Jan. 31, 1975, Ser. No. 545,894

Claims priority, application France, Feb. 28, 1973, 73.07107

Int. Cl.² C07C *17/28*

U.S. Cl. 260—653.3 **2 Claims**

1. A process for the preparation of tetrafluorobutadiene, which comprises reacting the compound of the formula $H-CF_2-CH=CH_2$ and the compound CF_3I in a molar excess of approximately 5 to 100 percent, in the presence of approximately 2 to 5 gram atoms of copper per mole of the compound CF_3I, in a solvent at a temperature of between about 120°C and about 150°C for a time to produce exclusively or substantially exclusively tetrafluorobutadiene.

3,925,492

PROCESS FOR PREPARING POLYCARBONMONOFLUORIDE

Rokuo Ukaji, Ibaraki; Tutomu Kamihigoshi, Takatsuki; Kenji Mikami, and Shoji Takaki, both of Settsu, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed May 30, 1974, Ser. No. 474,804

Claims priority, application Japan, May 30, 1973, 48-61076

Int. Cl.² C07C *17/00*

U.S. Cl. 260—653.9 **6 Claims**

1. In the process for preparing polycarbonmonofluoride by the reaction of carbon materials with fluorine gas, the improvement which comprises employing air as a diluent of said fluorine gas, said carbon materials being selected from the group consisting of carbon black petroleum coke, petroleum pitch coke charcoal, natural graphite and artificial graphite and the reaction being carried out at a temperature in the range from 250°C to 600°C.

3,925,493

PROCESS FOR PREPARING DICHLOROHEXADIENES

Andre A. Bader, and Francis J. Weiss, both of Pierre-Benite, France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Continuation of Ser. No. 636,672, May 8, 1967, abandoned. This application Apr. 20, 1970, Ser. No. 28,256

Claims priority, application France, May 13, 1966, 66.61472

Int. Cl.² C07C *21/02*

U.S. Cl. 260—654 R **3 Claims**

1. In a process for preparing dichlorohexadienes which comprises reducing acrolein by a known manner in a solution with a metal selected from the group consisting of copper, zinc or a mixture thereof or a zinc amalgam in the presence of an acid capable of forming a soluble metal salt with said metal to produce divinylglycol, the improvement comprising introducing at least a stoichiometric amount of HCl to the resultant reaction mixture and continuing the reaction to produce dichlorohexadienes therefrom.

3,925,494
RUTHENIUM COMPLEXES AS CATALYSTS FOR REDUCTION OF POLYENES

Darryl R. Fahey, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 140,564, May 5, 1971, abandoned. This application Dec. 20, 1972, Ser. No. 316,917

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] C07C *13/00*

U.S. Cl. 260—666 A **4 Claims**

1. A process for the partial hydrogenation of 1,5,9-cyclododecatriene to cyclododecene which comprises contacting 1,5,9-cyclododecatriene with a ruthenium-ligand complex catalyst consisting essentially of $(Ph_3P)_2(CO)_3Ru$ or $[Ru(CO)_4]_3$ under hydrogenation conditions which partially reduce 1,5,9-cyclododecatriene to cyclododecene.

3,925,495
HYDROCARBON CONVERSION IN THE PRESENCE OF A CATALYST OF A LEWIS ACID INTERCALATED IN GRAPHITE

Paul G. Rodewald, Rocky Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 6, 1974, Ser. No. 467,316

Int. Cl.[2] C07C *5/28*

U.S. Cl. 260—666 P **15 Claims**

1. A process for effecting skeletal isomerization of a hydrocarbon charge which comprises contacting said charge under isomerization conditions with a catalyst consisting essentially of graphite having intercalated in the lattice thereof between about 5 and about 75 weight percent of a Lewis acid consisting essentially of a halide of an element of Group II-A, III-A, IV-B, V or VI-B.

3,925,496
PRODUCTION OF STYRENE

Harold Shalit, Drexel Hill, and Joseph A. Kieras, Lincoln University, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jan. 21, 1974, Ser. No. 433,317

Int. Cl.[2] C07C *3/30*

U.S. Cl. 260—669 R **1 Claim**

1. In the method for the production of styrene by the thermal conversion, at a temperature in the range of from 600° to 850°C. at pressures ranging from 0.25 atmospheres to 10 atmospheres, absolute, and for a contact time in the range of from about 0.1 to 2.0 seconds, of alkyl benzenes selected from the group consisting of cumene and sec-butylbenzene the improvement comprising carrying out said thermal conversion of said alkylbenzene in the presence of added toluene, wherein the mole ratio of added toluene to said alkylbenzene hydrocarbon charge is in the range of from 0.1:1 to 10:1, thereby increasing the yield of styrene.

3,925,497
SUBSTITUTED 1,3,7-OCTATRIENES AND THEIR PREPARATION

Alden Dwayne Josey, and Jack Robert Kirchner, both of Wilmington, Del., assignors to E. I. DuPont de Nemours and Company, Wilmington, Del.

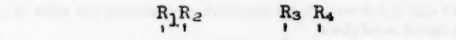
Continuation-in-part of Ser. No. 79,644, Oct. 9, 1970, abandoned. This application Oct. 24, 1973, Ser. No. 409,026

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] C07C *11/00*

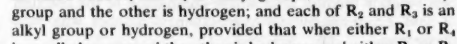
U.S. Cl. 260—677 R **18 Claims**

1. An alkyl substituted 1,3,7-octatriene of the formula

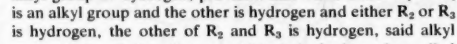


in which both R_1 and R_4 are alkyl groups, or either is an alkyl group and the other is hydrogen; and each of R_2 and R_3 is an alkyl group or hydrogen, provided that when either R_1 or R_4 is an alkyl group and the other is hydrogen and either R_2 or R_3 is hydrogen, the other of R_2 and R_3 is hydrogen, said alkyl groups being 1–8 carbon straight chain hydrocarbon alkyl groups.

7. A method of preparing an alkyl substituted octatriene according to claim 1 comprising: (A) homodimerizing (a) a monoalkyl butadiene of the formula



butadiene of the formula



in which formulas R_1 and R_2 are 1–8 carbon straight chain hydrocarbon alkyl groups; or, (B) codimerizing (a) 1,3-butadiene and one such monoalkyl butadiene or one such dialkyl butadiene, or (b) two different such monoalkyl butadienes or two different such dialkyl butadienes, or (c) one such monoalkyl butadiene and one such dialkyl butadiene, under liquid phase conditions in the presence of a catalyst which is a dienophile-coordinated palladium-phosphine complex.

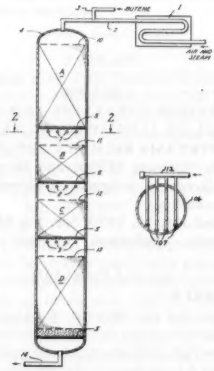
3,925,498
OXIDATIVE DEHYDROGENATION PROCESS

William P. Stadig, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Filed May 27, 1970, Ser. No. 40,772

Int. Cl.[2] C07C *5/48*

U.S. Cl. 260—680 E **25 Claims**



1. In a process for the oxidative dehydrogenation of organic compounds with a metal containing oxidative dehydrogenation catalyst in a fixed bed in the presence of oxygen by passing a mixture comprising said organic compound and oxygen through said fixed bed wherein the improvement comprises adding incremental amounts of oxygen to said organic compounds as said organic compounds pass through said fixed bed and intimately mixing said oxygen and said organic compounds, said adding and mixing occurring in the absence of said catalyst.

3,925,499
OXIDATIVE DEHYDROGENATION USING GROUP IA OR IIA METAL/SN/P/O CATALYST

Emory W. Pitzer, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

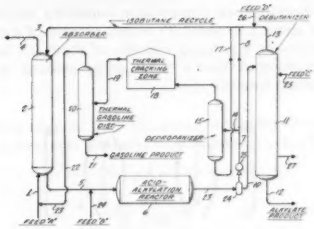
Division of Ser. No. 194,614, Nov. 1, 1971, Pat. No. 3,824,195. This application Apr. 1, 1974, Ser. No. 456,876
Int. Cl.² C07C 5/48
U.S. Cl. 260—680 E **8 Claims**

1. A method of oxidatively dehydrogenating an organic feed selected from the group consisting of alkenes, cycloalkenes, alkylpyridines, and alkylaromatics by contacting said feed with a free oxygen-containing gas and a catalyst prepared by:
   a. impregnating a calcined composition consisting essentially of tin, phosphorus and oxygen, said composition containing from about 0.1 to about 14 weight percent phosphorus, with a calcinable phosphorus-containing compound to increase the phosphorus content to a maximum of about 15 weight percent;
   b. calcining the composition produced in step (a);
   c. incorporating into the calcined composition of step (b) a calcinable compound of a metal selected from Group IA or IIA of the Periodic Table; and,
   d. calcining the composition formed in step (c) to produce said catalyst.

3,925,500
COMBINED ACID ALKYLATION AND THERMAL CRACKING PROCESS

William W. Wentzheimer, Glen Mills, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed June 26, 1974, Ser. No. 483,170
Int. Cl.² C07C 3/54
U.S. Cl. 260—683.44 **5 Claims**

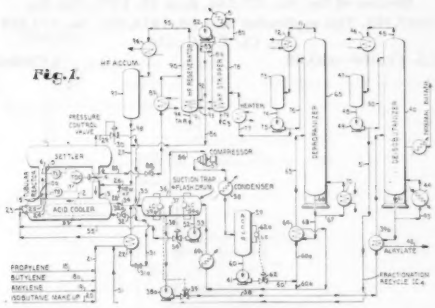


1. In an H_3PO_4-BF_3 catalyzed alkylation process wherein
   a. a hydrocarbon stream comprising pentane and lower boiling paraffins and olefins is separated in a liquid absorption zone to produce a liquid absorption stream containing a predominant portion of said olefins in said hydrocarbon stream, said liquid absorption stream being formed by passing isobutane as the absorbent in said zone,
   b. the isobutane absorbent and absorbed olefins in said absorption stream are alkylated in said H_3PO_4-BF_3 catalyzed alkylation zone to produce an alkylate product,
   c. the alkylation hydrocarbon phase is separated by distillation in a debutanizer and depropanizer into at least three fractions, the first fraction comprising said alkylate product is withdrawn from the debutanizer, the second fraction comprising propane and lower boiling hydrocarbons is removed as overhead from the depropanizer and the third fraction comprising unalkylated isobutane is separated from both the debutanizer and the depropanizer and recycled as absorbent to said absorption zone, the improvement which comprises
   d. thermally cracking said second fraction of step (c) which comprises propane and lower boiling hydrocarbons in a thermal cracking zone to produce a product stream comprising thermal gasoline, propylene, ethylene, unconverted propane and lower boiling paraffins,
   e. fractionating said product stream of step (d) to withdraw said thermal gasoline as a product of said process, and
   f. recycling said propylene, ethylene, unconverted propane and lower boiling paraffins from said fractionating step (e) to said absorption zone in step (a).

3,925,501
HYDROGEN FLUORIDE ALKYLATION WITH EFFLUENT REFRIGERATION

David H. Putney, Shawnee Mission, Kans., and Ward A. Graham, Kansas City, Mo., assignors to Stratford Engineering Corporation, Kansas City, Mo.

Filed Mar. 4, 1974, Ser. No. 447,648
Int. Cl.² C07C 3/54
U.S. Cl. 260—683.48 **13 Claims**



1. A process of effluent refrigeration applied to the alkylation of isoparaffinic hydrocarbons by olefinic hyrodcarbons wherein hydrogen fluoride is the alkylation reaction catalyst and
   the reaction vessel comprises an elongate vertical tube interconnecting an overhead settler vessel and a below-situated acid cooler vessel,
   there being an additional valve-controlled recycle flow line interconnecting the settler and acid cooler,
   whereby circulation of liquid alkylation reaction mixture occurs upwardly through said reaction vessel to said settler and separated acid returns from said settler downwardly through said flow line to said cooler vessel, comprising the steps of:
   a. admixing said isoparaffinic hydrocarbons and said olefinic hydrocarbons with liquid hydrogen fluoride catalyst in an alkylation reaction step in said reaction vessel,
   b. passing said reaction mixture of hydrocarbons, including alkylate, propane and isobutane, and said catalyst from said reaction vessel overhead to said settler,
   c. maintaining said settler, said reactor and said acid cooler under sufficient back pressure to maintain all of said reaction mixture in liquid phase,
   d. withdrawing overhead from said settler a hydrocarbon phase which comprises primarily isobutane and alkylate and a minor amount of propane and catalyst,
   e. reducing the pressure on said hydrocarbon phase to vaporize excess volatile hydrocarbons, thereby refrigerating said hydrocarbon phase,
   f. passing at least a substantial portion of said refrigerated hydrocarbon phase, including both liquid and vapor without separation, in indirect heat exchange with said acid in said acid cooler whereby to lower the temperature thereof,
   g. passing said hydrocarbon phase, after use of same as a heat exchange medium in step (f) to a vapor-liquid separating step,

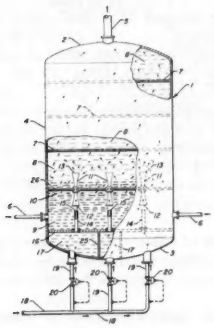
h. the vapor phase from said separating step being passed to a depropanizing step and overhead from said depropanizing step being passed to an HF stripping step,
i. recycling hydrogen fluoride catalyst from said stripping step to the alkylation reaction in step (a),
j. passing a first portion of the separation step liquid bottoms from step (g) to a deisobutanizing step and recycling overhead liquids from said deisobutanizing step to the reaction step (a), and
k. withdrawing alkylate product bottoms from said deisobutanizing step.

3,925,502

ALKYLATION PROCESS

William G. Boney, Arlington Heights, and Paul J. Kuchar, Hinsdale, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 373,544, June 25, 1973, Pat. No. 3,867,103. This application May 30, 1974, Ser. No. 474,569
Int. Cl.² C07C *3/54*
U.S. Cl. 260—683.48 **4 Claims**



1. In the liquid-phase, acid-catalyzed reaction of an isoparaffin with an olefin to form a high octane alkylate the process which comprises:
a. maintaining acid alkylation catalyst in a lower section of a reaction vessel,
b. maintaining a turbulent mass of acid-hydrocarbon emulsion in an upper section of said vessel,
c. injecting a mixture of an olefin and an isoparaffin into and through a plurality of standpipes disposed within said reaction vessel and communicating with said lower section,
d. passing the mixture from said standpipes into a plurality of venturi-shaped conduits disposed within said vessel and communicating with said lower section above said plurality of standpipes and with said upper section,
e. effecting the injection of said mixture through said standpipes at sufficient velocity to aspirate acid catalyst from said lower section into and through said conduits thus reacting said olefin and isoparaffin in said conduits, the reaction effluent through said conduits being at an acid to hydrocarbon ratio of less than one,
f. discharging said reaction effluent from said conduits into said mass of emulsion and effecting agitation of the emulsion,
g. passing acid catalyst, in addition to the acid aspirated into said conduit, through said lower section into said mass of emulsion in said upper section, and
h. completing the olefin-isoparaffin reaction in said turbulent mass of emulsion in said upper section of said reaction vessel in contact with the combining acid catalyst which is aspirated into and through said conduits and which is passed through said lower section into said mass of emulsion of said upper section.

3,925,503

ISOMERIZATION OF NORMAL PARAFFINS WITH HYDROGEN MORDENITE CONTAINING PLATINUM AND PALLADIUM

R. Parthasarathy, Silver Spring, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Feb. 6, 1975, Ser. No. 547,666
Int. Cl.² C07C *5/30*
U.S. Cl. 260—683.65 **3 Claims**

1. A process for isomerizing normal paraffins having from 4 to 6 carbon atoms per molecule which comprises contacting said normal paraffins in the presence of hydrogen at a temperature of 500° to 600°F. with hydrogen mordenite having incorporated therewith, a mixture of platinum and palladium in a concentration of 0.3 to 2.0 percent, wherein the ratio of platinum to palladium in said mixture is in the range of 2 to 4.

3,925,504

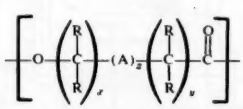
POLY(HYDROXY ETHER) POLYMERS BLENDED WITH CYCLIC ESTER POLYMERS

Joseph Victor Koleske; Clyde Jesse Whitworth, Jr., both of Charleston, W. Va., and Robert Dean Lundberg, Somerville, N.J., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 140,951, May 6, 1971, Pat. No. 3,781,381, which is a continuation-in-part of Ser. No. 812,314, April 1, 1969, abandoned. This application Oct. 11, 1973, Ser. No. 405,514
Int. Cl.² C08L *71/00*, *67/00*
U.S. Cl. 260—823 **8 Claims**

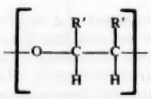
1. A thermoplastic composition consisting essentially of a blend of about 1 to about 95 weight percent of a cyclic ester polymer having a reduced viscosity of about 0.1 to about 15 and containing at least a major molar amount of recurring units I of the formula:

(I)



wherein each R, individually, is selected from the class consisting of hydrogen, alkyl, halo, and alkoxy; A is the oxy group; x is an integer from 1 to 4; y is an integer from 1 to 4; z is an integer of zero or one; with the provisos that (a) the sum of $x + y + z$ is at least 4 and not greater than 7, and (b) the total number of R substituents which are substituents other than hydrogen does not exceed 3, and up to a minor molar amount of recurring units II of the formula:

(II)



wherein each R′ is selected from the class consisting of, individually, hydrogen, alkyl, cycloalkyl, aryl, and chloroalkyl, and, together with the ethylene moiety of the oxyethylene chain of Unit II, a saturated cycloaliphatic hydrocarbon ring having from 4 to 8 carbon atoms, and about 5 to about 99 weight percent of an aromatic poly(hydroxy ether) as the thermoplastic organic polymer, said aromatic poly(hydroxy ether) being the reaction product of an aromatic dihydroxy compound having from 6 to 24 carbon atoms with an epihalohydrin, said percentages being based on the total weight of thermoplastic polymer and cyclic ester polymer.

3,925,505
THERMOPLASTIC MOLDING COMPOSITION BASED ON POLY (OXYMETHYLENES)

Günter Sextro, Naurod, Taunus, and Karlheinz Burg, Langenhain, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 281,127, Aug. 16, 1972, abandoned. This application May 3, 1974, Ser. No. 466,899

Int. Cl.² C08G *16/06, 4/00*

U.S. Cl. 260—823 **9 Claims**

1. A thermoplastic molding composition comprising poly-(oxymethylene) containing from 0.1 to 40% by weight of polyether segments having a number average molecular weight (Mn) of at least 500 and at least two different structural units, said polyether segments containing from 30 to 95% by weight of units derived from tetrahydrofurane, from 0 to 60% by weight of units derived from ethylene oxide and from 0 to 40% by weight of units derived from 3,3-bis(chloromethyl)oxacyclobutane, said polyether segments containing at least 5% by weight of units derived from ethylene oxide or 3,3-bis(chloromethyl)oxacyclobutane.

3,925,506
POLYMER MODIFIED POLYOLS

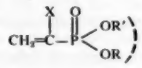
Jung Il Jin, Irvington, N.Y., and Jesse C. H. Hwa, Stanford, Conn., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Apr. 1, 1974, Ser. No. 456,580

Int. Cl.² C08L *63/00*

U.S. Cl. 260—836 **21 Claims**

1. A process for forming a modified polyol which comprises polymerizing in the presence of a polyol a monomer charge which comprises at least one monomer containing an ethylenically unsaturated group and at least one (hydrocarbyl) vinylphosphonate having the structure



wherein X is selected from the group consisting of hydrogen, halogen, cyano, aryl, haloaryl, C_1–C_{18} alkyl, C_1–C_{18} haloalkyl and

wherein R and R′ are hydrocarbyl and substituted hydrocarbyl groups consisting essentially of hydrogen and carbon and containing up to about 18 carbon atoms inclusive with the proviso that R and R′ may be the same, different or conjoint.

3,925,507
HEAT-CURABLE PULVERULENT COATING AGENT CONSISTING OF A MIXTURE OF COPOLYMERS CONTAINING GLYCIDYL GROUPS, DICARBOXYLIC ACID ANHYDRIDES AND CURING ACCELERATORS

Themistoklis Katsimbas, Hamburg, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Filed May 30, 1974, Ser. No. 474,531

Int. Cl.² C08L *63/00*

U.S. Cl. 260—836 **6 Claims**

1. Pulverulent coating agent of a mixture of

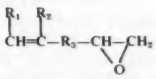
A. a copolymer of relatively low moelcular weight, which contains glycidyl groups and is a copolymer of several ethylenically unsaturated compounds,

B. at least one dicarboxylic acid anhydride in an amount corresponding to 0.4 – 1.0 anhydride group per epoxy group (hydroxyl group) of the copolymer and

C. a curing accelerator in the form of an organic base,

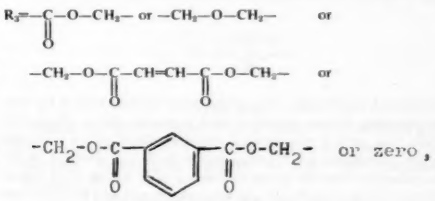
D. a flow control agent in an amount of at least 0.05 percent by weight of the mixture, which agent is a polymer of molecular weight (M_n) of at least 1,000 and has a glass transition temperature which is at least 50°C lower than the glass transition temperature of the copolymer (A), characterised in that the component (A) consists of 84 to 94 percent by weight of copolymers containing epoxide groups and hydroxyl groups, which copolymers have Durran softening points of about 90°–120°C and are soluble in organic solvents and comprise:

a. 6–24 percent by weight of ethylenically unsaturated epoxide monomers with 6–12 carbon atoms, of the general formula



wherein

R_1 and R_2 = H— or —CH_3,



b. 4–20 percent by weight of hydroxyalkyl esters of acrylic acid or methacrylic acid, with the hydroxyalkyl ester group being saturated and containing 2–4 C atoms,

c. 24–38 percent by weight of acrylic acid esters of aliphatic saturated monoalcohols with 1–8 carbon atoms,

d. 6–14 percent by weight of methacrylic acid esters of aliphatic saturated monoalcohols with 1–8 carbon atoms and

e. 24–42 percent by weight of styrene or vinyltoluene, the component (B) consisting of 6–16 percent by weight of at least one dicarboxylic acid anhydride with melting points of about 60°–140°C, the component (C) consisting of 0.5–1.8 percent by weight of N′,N′-bis-(dimethylaminoisobutylidene)-melamine and the optional component (D) consisting of a flow control agent and other customary additives.

3,925,508
PROCESS TO REDUCE BLOCKING IN ETHYLENE OR PROPYLENE POLYMER OF COPOLYMER FILMS WITHOUT REDUCING THEIR OPTICAL PROPERTIES

Elias Agouri, Residence du Manoir, Avenue Couderes; Claude Favie, 14 rue de Coutras, both of 64 Pau, and Jean-Claude Rebeille, Residence Les-Chenes Rue du Lys, 64140 Billere, all of France

Filed Dec. 26, 1973, Ser. No. 428,120

Claims priority, application France, Dec. 28, 1972, 72.46603; Dec. 13, 1973, 73.44467

Int. Cl.² C08L *23/04, 23/10, 23/08*

U.S. Cl. 260—876 R **30 Claims**

1. A process to reduce blocking in flat and tubular films made from ethylene or propylene polymers or copolymers, without reducing their optical properties, characterized by the fact that the said polymers or copolymers, at some point during production of the films, are mixed with at least one graft copolymer consisting essentially of an ethylene or propy-

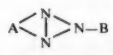
lene substrate and at least one vinylaromatic monomer grafted thereto, the quantity of the graft copolymer being such that the polymeric part derived from the vinylaromatic monomer represents less than 1% of the weight of the polymer or copolymer used to make the films.

3,925,509
LIGHT STABILIZED POLYPHENYLENE ETHER RESIN COMPOSITION

Glen D. Cooper, and Visvaldis Abolins, both of Delmar, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 26, 1973, Ser. No. 428,448
Int. Cl.[2] C08L *51/00, 53/00*
U.S. Cl. 260—876 R **8 Claims**

1. A stabilized composition comprising a major amount of a thermoplastic resin having from 20–80 parts by weight of a normally unstable polyphenylene ether component, from 20–80 parts by weight of a rubber modified, high-impact styrene resin and from 0.5–5 parts by weight of a stabilizer which comprises in combination, a first component which is an ultra-violet light absorber selected from the group consisting of hydroxybenzotriazoles of the formula:



wherein A represents an o-phenylene radical bound by two neighboring carbon atoms to two nitrogen atoms of the triazole ring, and B represents a phenyl radical which contains in the 2-position an OH group and in further positions a member selected from the group consisting of H, lower alkyl, lower alkoxy, lower carbalkoxy, cyclohexyl, phenyl and halogen and a second component which is an organic nickel complex, the weight ratio of the first component to the second component being from 0.25:1 to 4:1.

3,925,510
VINYL CHLORIDE POLYMER COMPOSITION

Fumio Ide; Kazuo Kishida, and Akira Hasegawa, all of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Mar. 21, 1974, Ser. No. 453,543
Claims priority, application Japan, Mar. 26, 1973, 48-33465; Apr. 19, 1973, 48-44328; May 28, 1973, 48-59568
Int. Cl.[2] C08L *51/04, 27/06, 31/02*
U.S. Cl. 260—876 R **10 Claims**

1. A thermoplastic vinyl chloride polymer composition which comprises

I. 80 to 99.9 parts by weight of polyvinyl chloride and/or a copolymer containing no less than 80% by weight of vinyl chloride and no greater than 20% by weight of at least one other copolymerizable ethylenically unsaturated monomer, and

II. 20 to 0.1 parts by weight of a methyl methacrylate composite polymer characterized by the combination of

10 to 60% by weight of component A consisting essentially of, in polymerized form, 80 to 100% by weight of methyl methacrylate, 0 to 20% by weight of at least one copolymerizable monoethylenically unsaturated monomer and 0 to 2% by weight of at least one copolymerizable polyfunctional monomer having at least two ethylenically unsaturated bonds, and having a reduced viscosity $\eta sp/C$ of at least 2.0;

40 to 80% by weight of component B consisting essentially of in polymerized form, 30 to 80% by weight of styrene and 70 to 20% by weight of an acrylic acid ester or a methacrylic acid ester, the component B being prepared by polymerizing monomers thereof in the presence of a preformed latex of the component A and having a reduced viscosity $\eta sp/C$ of not greater than 1.0; and,

0 to 40% by weight of component C consisting essentially of, in polymerized form, 80 to 100% by weight of methyl methacrylate and 0 to 20% by weight of at least one copolymerizable monoethylenically unsaturated monomer and 0 to 2% by weight of at least one copolymerizable polyfunctional monomer having at least two ethlenically unsaturated bonds, the component C being prepared by polymerizing monomers thereof in the presence of a preformed latex of the component B.

3,925,511
METALLATION OF POLYMERS AND SUBSEQUENT REACTION TO FORM MODIFIED OR GRAFTED POLYMERS

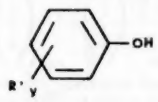
Frederick C. Loveless, Cheshire, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Filed Aug. 27, 1973, Ser. No. 391,903
Int. Cl. C08d *5/02;* **C08f** *47/00*
U.S. Cl. 260—877 **19 Claims**

1. A method of metallating a polymer having activated hydrogen atoms which is a polymer of a conjugated diene comprising contacting a solution of said polymer in an inert liquid hydrocarbon solvent, selected from the group consisting of a saturated aliphatic solvent and benzene with

A. an organolithium compound having the formula RLi wherein R is a hydrocarbon radical selected from the group consisting of aliphatic, cycloaliphatic and aromatic radicals and

B. a hydrocarbon-soluble cocatalyst complex of a potassium or sodium alkylphenolate which is a reaction product of (I) a hydrocarbon-soluble alkylphenol of the formula



wherein R′ is an alkyl group containing a minimum of 8 carbon atoms per group and a maximum of 26 carbon atoms in one or more such groups and y is an integer from 1 to 3, inclusive, with (II) an alkali metal compound MOR″ where R″ is selected from the group consisting of hydrogen and aliphatic, cycloaliphatic and aromatic hydrocarbon radicals and M is potassium or sodium, the said hydrocarbon-soluble cocatalyst complex having been formed by bringing the said reactants (I) and (II) together under an inert atmosphere in an inert liquid hydrocarbon solvent, with agitation, in amount of 1 mole of alkylphenol (I) per mole of alkali metal compound (II) when M is potassium and in amount of 2 moles of alkylphenol (I) per mole of alkali metal compound (II) when M is sodium, to form a hyurocarbon-soluble complex of alkali metal alkylphenolate and by-product of the reaction of (I) with (II), the molar ratio of (A) organolithium compound to (B) potassium or sodium alkylphenolate complex being from 20:1 to 0.5:1, the said metallation being carried out at a temperature of from 0°C to 100°C for a period of time 1 to 30 hours, the amount of organolithium compound (A) present during the metallation being from 0.1 to 200 moles per mole of polymer, the mixture being agitated during the metallation.

3,925,512

PROCESS FOR THE PREPARATION OF BLOCK COPOLYMERS CONTAINING α-METHYLSTYRENE

Bernard C. Roest, Geleen, and Herman A. J. Schepers, Stein, both of Netherlands, assignors to Stamicarbon N.V., Geleen, Netherlands

Filed Apr. 7, 1972, Ser. No. 242,234

Claims priority, application Netherlands, Apr. 14, 1971, 7104949

Int. Cl.² C08L *9/06, 25/10, 25/16*

U.S. Cl. 260—880 B **13 Claims**

1. In a process for the preparation of copolymers comprising polymer blocks of the formulae A-B-C and $(B\text{-}C)_n$, wherein B is an elastomeric diene polymer block of butadiene or isoprene, C is a polymer block of alpha-methylstyrene, and A is C or a non-elastomeric polymer block of styrene, and *n* is defined hereinafter, said process comprising forming a living polymer carrying at least one negatively charged diene unit in the end position by polymerization of said diene at a temperature of about 20° to about 100° C in the presence of an organo lithium compound initiator having a functionality of *n*, and thereafter polymerizing alpha-methylstyrene on said living polymer at a temperature below about 15°C to form an alpha-methylstyrene polymer block, the improvement comprising polymerizing on said living polymer from 1 to 100 monomer units of styrene per diene anion in the end position, at a temperature of about 20° to about 100°C, prior to the polymerization of said alpha-methylstyrene, whereby the cross-over reaction from the polymer block with said dienyl anion in the end position to the alpha-methylstyrene is facilitated.

3,925,513

MOULDING COMPOSITIONS

Herbert Schuster, Koeln-Stammheim, Germany; Edmund Huther, Rio de Janeiro, Brazil; Karl-Heinz Ott, Leverkusen, and Karl Dinges, Odenthal, both of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed May 25, 1972, Ser. No. 256,936

Claims priority, application Germany, May 26, 1971, 2126151

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

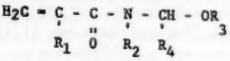
Int. Cl.² C08L *33/00, 39/00*

U.S. Cl. 260—883 **13 Claims**

1. A process for the production of high impact and ageing-resistant molding composition, which process comprises polymerizing (A) total of 95 parts by weight of a monomer mixture consisting of

i. styrene, nuclear or side chain alkyl styrene or a mixture thereof and

ii. acrylonitrile, methacrylonitrile or a mixture thereof in a weight ratio of (i) : (ii) of 100:0 to 60:40 in an aqueous dispersion at a temperature of from 60° to 70°C. in the presence of 5 to 90 parts by weight of (B) an elastomer, which elastomer is an emulsion polymer prepared at a temperature of below 70°C. and comprising in polymerized form from 94 to 99.5 parts by weight of an alkyl ester of acrylic acid having from 4 to 10 carbon atoms in the alkyl group and 6 to 0.5 parts by weight of an acrylamide or methacrylamide-N-alkylol compound of the formula



wherein

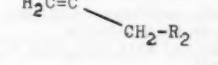
R_1 is hydrogen or methyl;

R_2 is hydrogen or alkyl having from 1 to 8 carbon atoms;

R_3 is hydrogen, alkyl having 1 to 10 carbon atoms or carboxyalkyl having from 1 to 10 carbon atoms and

R_4 is hydrogen or methyl.

11. A molding composition which comprises from 5 to 50 parts by weight of an elastomer, which elastomer comprises in polymerized form from 94 to 99.5 parts by weight of an alkyl ester of acrylic acid having from 4 to 10 carbon atoms in the alkyl group and from 6 to 0.5 parts by weight of an acrylamide or methacrylamide-N-alkylol compound of the formula:



wherein

R_1 is hydrogen or methyl;

R_2 is hydrogen or alkyl having from 1 to 8 carbon atoms;

R_3 is hydrogen, alkyl having 1 to 10 carbon atoms or carboxyalkyl having from 1 to 10 carbon atoms and

R_4 is hydrogen or methyl

and 95 to 50 parts by weight of a polymerized mixture consisting of

i. styrene, nuclear or side chain alkyl styrene or a mixture thereof and

ii. acrylonitrile, methacrylonitrile or a mixture thereof in a weight ratio of (i) : (ii) of 100:0 to 60:40,

at least 20% of said polymerized mixture having been graft polymerized in the presence of the elastomer in an aqueous dispersion.

3,925,514

RUBBER IMPROVEMENT WITH POLYCYCLOPENTENE

Jacques R. Kohler, and Frederik L. Binsbergen, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 5, 1974, Ser. No. 494,580

Int. Cl.² C08L *9/06, 23/2*

U.S. Cl. 260—889 **7 Claims**

1. A process for improving the green strength of a butadiene rubber selected from the group consisting of butadiene homopolymers and copolymers of butadiene containing at least 70% butadiene by admixing said butadiene rubber with from about 5 to about 50 parts per hundred rubber (phr) of a high viscosity polycyclopentene having a limiting viscosity number (LVN) of at least 4 dl/g and having about 75% to 99% of the double bonds present in the trans configuration.

3,925,515

2-METHYLENE PROPANE PHOSPHONIC ACID ESTERS

Eugen Velker, Dormagen-Hackenbroich; Francis Bentz, Cologne, and Gunther Nischk, Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed Dec. 1, 1972, Ser. No. 311,413

Claims priority, application Germany, Dec. 3, 1971, 2160019; Dec. 3, 1971, 2160021

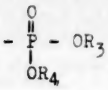
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C07F *9/40*

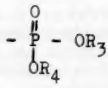
U.S. Cl. 260—932 **4 Claims**

1. 2-methylene propane phosphonic acid esters corresponding to the general formula

in which R_1 represents halogen or the radical



and R_2 the radical



where R_3 and R_4 are C_1–C 4-alkyl.

3,925,516

S-(α-SUBSTITUTED-ARYLMETHYLTHIO, -ARYLMETHYLSULFINYL, AND -ARYLMETHYLSULFONYL)METHYLPHOSPHORUS ESTERS

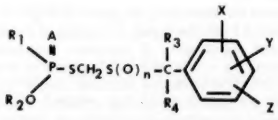
Frank Albert Wagner, Jr., and Roger Williams Addor, both of Pennington, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 347,308, April 2, 1973, abandoned. This application Apr. 5, 1974, Ser. No. 458,376

Int. Cl.[2] C07F *9/165, 9/40;* **A01N** *9/36*

U.S. Cl. 260—940 **12 Claims**

1. An organophosphorus compound having the formula:



wherein R_1 represents a member selected from the group consisting of C_1-C_4 alkyl, C_1-C_4 alkoxy, C_3-C_6 alkoxyalkyl, C_3-C_6 alkoxyalkylthio and C_1-C_4 alkylthio; R_2 is C_1-C_4 alkyl; R_3 represents a member selected from the group consisting of hydrogen and C_1-C_4 alkyl; R_4 is C_1-C_4 alkyl; A represents a member selected from the group consisting of sulfur and oxygen; n represents an integer selected from 0, 1 and 2; X and Y each represent members selected from hydrogen, alkyl C_1-C_4 and halogen; and Z represents a member selected from the group consisting of hydrogen, C_1-C_4 alkyl, C_1-C_4 alkoxy, cyano, halogen, C_1-C_4 alkylthio, CCl_3, CF_3, and nitro.

3,925,517

PHOSPHORYLFORMAMIDINES

Georg Pissiotas, Lorrach, Germany; Willy Meyer, Basel, Switzerland; Beat Bohner, Binningen, Switzerland, and Jozef Drabek, Allschwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

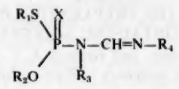
Filed Oct. 23, 1974, Ser. No. 517,358

Claims priority, application Switzerland, Nov. 5, 1973, 15561/73; July 29, 1974, 10397/74

Int. Cl.[2] A01N *9/36;* **C07F** *9/24*

U.S. Cl. 260—944 **9 Claims**

1. A phosphorylformamidine of the formula



wherein

R_1, R_3 and R_4 represent C_1-C_3-alkyl,

R_2 represents methyl or ethyl, and

X represents oxygen or sulphur.

3,925,518

BIS(PHENYL)AMIDOTRIOPHOSPHATES

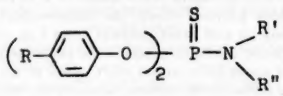
Richard Spector, Kendall Park, and Joseph Anthony Stretanski, Clinton, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 351,043, April 13, 1973. This application Nov. 5, 1973, Ser. No. 412,922

Int. Cl.[2] C07F *9/24;* **C08K** *5/53*

U.S. Cl. 260—958 **7 Claims**

1. A compound having the formula:



wherein:

R is alkyl or 1–6 carbons, or halogen;

R′ is cyclohexyl; and

R″ is hydrogen or R′.

3,925,519

DEODORIZED MERCAPTAN-CONTAINING PHOSPHOROTRITHIOITES AND PROCESS OF PREPARATION

Ross A. Kremer, Belle Mead, and Richard H. Leitman, Kendall Park, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 6, 1974, Ser. No. 467,026

Int. Cl.[2] C07F *9/201*

U.S. Cl. 260—967 **10 Claims**

1. A method for stabilizing against malodor development a normally malodorous mercaptan-containing phosphorotrithioite compound having the following general formula:

$$P(SR)_3$$

wherein R is a C_1—C_8 alkyl which comprises adding to said compound from about 0.05 to about 1.5% by weight, based on the weight of said compound, of a C_1—C_{20} alkyl anhydride to stabilize said compound against malodor development.

3,925,520

ALKYLATION OF N-ACYL-O-HYDROCARBYLPHOSPHOROAMIDOTHIOATE SALTS

Hans G. Franke, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

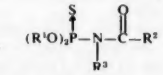
Continuation-in-part of Ser. No. 317,479, Dec. 21, 1972, Pat. No. 3,832,425. This application June 17, 1974, Ser. No. 479,972

Int. Cl.[2] C07F *9/24*

U.S. Cl. 260—979 **9 Claims**

1. A process for producing an O-hydrocarbyl-S-hydrocarbyl-N-acylphosphoroamidothioate which comprises:

1. reacting an N-acylphosphoroamidothioate of the formula



wherein R^1 individually is alkyl, alkenyl, or alkynyl of up to six carbon atoms, R^2 has up to 18 carbon atoms and is hydrogen, alkyl, alkenyl, phenyl, aralkyl or alkaryl substituted with up to three fluorine, chlorine or bromine atoms or with up to one alkoxy or alkylthio of up to four atoms, and R^3 is hydrogen or alkyl of one to six carbon atoms, with an ammonium, sulfide or polysulfide in aqueous phase at a temperature of about 10°C to 125°C to produce an S-ammonium salt of the N-acyl-phosphoroamidothioate, and

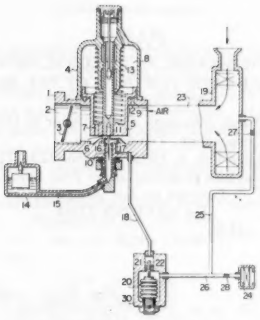
2. reacting the resulting S-ammonium salt with an alkylating agent in an inert solvent at a temperature of 0° to 80°C. to produce the O-hydrocarbyl-S-hydrocarbyl-N-acyl-phosphoroamidothioate.

3,925,521

VARIABLE VENTURI TYPE CARBURETOR

Tadahiko Otani, Katsuta, Japan, assignor to Hitachi, Ltd., Japan

Filed May 15, 1974, Ser. No. 470,277
Claims priority, application Japan, May 18, 1973, 48-54567
Int. Cl.² F02M 9/06
U.S. Cl. 261—39 A **9 Claims**



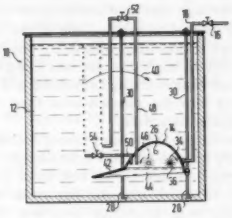
1. A variable Venturi type carburetor which consists of a carburetor main body having an induction passage extending through it and connected to an air cleaner, a piston movably arranged so as to project into said induction passage for thereby forming a Venturi section, means responsive to the pressure in said Venturi section to move the piston for thereby maintaining the pressure in the Venturi section at a substantially constant level, fuel metering means consisting of an orifice integrally formed in the carburetor main body and a needle mounted to said piston, and means for supplying the fuel into said fuel metering means, characterized by a small chamber arranged between said orifice and Venturi section so as to be in communication with said Venturi section through a second orifice; air metering means in communication with said small chamber; a first air passage communicating said air metering means with said air cleaner; a second air passage communicating said air metering means with atmosphere; atmospheric density sensitive means responsive to the atmospheric density to operate said air metering means; and wherein said first and second air passages are respectively provided with means for controlling the air passing resistance.

3,925,522

APPARATUS FOR DISSOLVING OXYGEN IN WATER

Richard Schreiber, Martinstrasse 31, 61 Darmstadt, Germany

Filed Apr. 3, 1973, Ser. No. 347,579
Claims priority, application Germany, Apr. 7, 1972, 2216917
Int. Cl.² B01F 3/04
U.S. Cl. 261—92 **12 Claims**



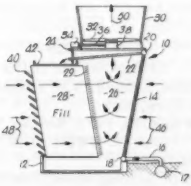
1. Apparatus for dissolving oxygen in water comprising an elongate inverted channel shaped receptacle, closed at the top, completely submerged below the surface of a body of water and filled partly with an oxygen containing gas to establish a gas-water interface in said receptacle at a higher than atmospheric pressure, means for supplying gas to the receptacle continuously under at least approximately the hydrostatic pressure at the location of the receptacle, and at least one rotary brush mounted in the receptacle for rotation across said interface for mixing the gas and the water and for producing a water flow across the receptacle, discharge means for removing the gas which is not dissolved from the receptacle and introducing the same in the form of bubbles into the body of water outside the receptacle, the improvement comprising means for causing the gas to traverse the receptacle from an inlet at one end thereof in the longitudinal direction thereof to an outlet at the other end, said brush extending approximately over the entire length of the receptacle and being mounted on a shaft which extends in the longitudinal direction of the receptacle, said discharge means comprising a pipe and a valve connected in the pipe, the opening of the pipe through which the gas is introduced into the water outside the receptacle being at a depth at which the hydrostatic pressure is slightly smaller than the pressure of the gas discharged from the receptacle.

3,925,523

OPPOSED AIR PATH WET-DRY COOLING TOWER AND METHOD

Robert E. Cates, Leawood, Kans., assignor to The Marley Company, Mission, Kans.

Filed Nov. 12, 1973, Ser. No. 414,639
Int. Cl.² B01F 3/04
U.S. Cl. 261—151 **20 Claims**



1. In a water cooling tower, the combination of:

spaced, separate, horizontally aligned, indirect and evaporative heat exchange structures adapted to receive hot water to be cooled for lowering the temperature thereof;

means for serially delivering the hot water first to one of

said heat exchange structures for initial cooling thereof and thence to the other of said heat exchange structures for further cooling of the same,

said heat exchange structures each having ambient air inlets and respective hot air outlets both communicating with an enclosed common plenum area which discharges to the atmosphere; and

means communicating with said plenum area for simultaneously moving ambient derived first and second air streams through the heat exchangers respectively from the inlets thereof to said outlets of the same in thermal interchange relationship with water passing therethrough whereby hot dry air is directed into said plenum area from the indirect heat exchange structure and hot moist air is discharged into the plenum area from the evaporative heat exchange structure,

the heat exchange structures being located relatively in sufficiently closely spaced relationship and disposition causing the hot dry air to exit from the indirect heat exchange structure and the hot moist air to leave the evaporative heat exchange structure along respective paths for collision intersection of the same within and throughout the common vertical height thereof in the plenum area to assure thorough admixing thereof prior to discharge of the mixture to the atmosphere.

3,925,524

PROCESS FOR THE PRODUCTION OF CARBON FILAMENTS

Robert M. Kimmel, Springfield, N.J.; John P. Riggs, Mount Vernon, Ind.; Robert W. Swander, Charlotte, N.C., and Wells Whitney, Menlo Park, Calif., assignors to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 265,123, June 22, 1972, abandoned. This application Aug. 17, 1973, Ser. No. 389,280

Int. Cl. B29c *25/00*; **C01b** *31/07*

U.S. Cl. 264—29 **20 Claims**

1. In a process for the production of a carbon filament from a dry spun acrylic filament selected from the group consisting essentially of an acrylonitrile homopolymer and an acrylonitrile copolymer which contains at least about 85 mol percent acrylonitrile units and up to about 15 mol percent of one or more copolymerized monovinyl units which is capable of absorbing water, comprising thermally stabilizing said filament until non-burning when subjected to an ordinary match flame, and heating said stabilized filament in a non-oxidizing atmosphere at a temperature of at least about 1000°C. until a carbonaceous filament is formed which contains at least about 90 percent carbon by weight; the improvement comprising contacting said dry spun acrylic filament prior to said thermal stabilization with water at a temperature of about 20° to 90°C. until said filament substantially becomes water-laden, and drawing the resulting water-laden acrylic filament while suspended in a heated gaseous atmosphere at a temperature of at least 100°C. to form an acrylic filament having a highly microporous and fibrillar internal structure which is particularly suited for thermal conversion to a carbon filament.

3,925,525

SPINNING METHOD

Herman L. LaNieve, Summit, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Aug. 10, 1973, Ser. No. 387,407

Int. Cl.² F02M *11/00*

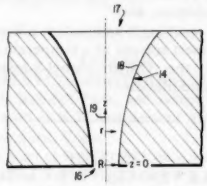
U.S. Cl. 264—40 **13 Claims**

1. In a method of spinning fibers from fiber-forming, liquid polymeric material utilizing a spinneret for extruding said material through at least one converging nozzle passageway having an entry opening and an exit orifice, the improvement comprising establishing an essentially constant extensional strain rate condition for flow of said liquid through said passageway by providing a nozzle passageway bounded by gradually curving walls having a profile described essentially by the equation

$$1/r_w^2 = Az + 1/R^2$$

where:

R is the perpendicular distance between an axis of the passageway and the nozzle wall at the exit orifice;



r_w is the perpendicular distance between nozzle wall and points along that axis;

Z is the distance along that axis measured from said exit orifice; and

A is a constant.

3,925,526

METHOD OF MAKING AN INTEGRAL SKIN FOAMED PRODUCT WHEREIN PORTIONS OF THE SKIN ARE OF GREATER DENSITIES

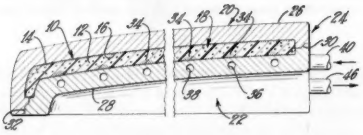
James Lynn Haas, Aliquippa, Pa., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Feb. 4, 1972, Ser. No. 223,621

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² B29D *27/04*

U.S. Cl. 264—45.5 **1 Claim**



1. A method of making a product having a foam core and a skin, which skin differs in density at portions thereof, said method comprising preparing an exothermic, foamable, thermosetting resin reaction mixture including a liquid blowing agent which vaporizes at a temperature between about 20° and 400°F., placing an amount of the mixture in a mold cavity, said amount being sufficient to cause the resulting foam to contact the entire walls of the mold, closing the mold, cooling certain areas of the walls of the mold cavity to a temperature sufficiently low as to cause the blowing agent to condense in those areas and redissolve in the mixture, and thereby form the skin for the product at different densities with denser portions of the skin being located at the surface of the product adjacent the cooled areas, and heating areas of the walls of the mold cavity between cooled areas and thereby form thinner skin areas for the product at the surface portions adjacent the heated areas.

3,925,527

METHOD OF MAKING FOAMED URETHANE RESINS HAVING IMPROVED MOLD RELEASE PROPERTIES

Helmut Kleimann; Wulf von Bonin, both of Leverkusen; Heinz-Georg Schneider, Gummersbach, and Herbert Gebauer, Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen Bayerwerk, Germany

Filed Jan. 30, 1974, Ser. No. 438,111

Claims priority, application Germany, Apr. 18, 1973, 2319648

Int. Cl.² C08G *18/14;* **G08G** *18/36;* **C08K** *5/16*

U.S. Cl. 264—53 **14 Claims**

1. In a process for molding foam products wherein a foamable reaction mixture containing an organic polyisocyanate is reacted in a closed mold, said foamable reaction mixture being adapted to expand and fill the mold while closed, the improvement which comprises including in the foamable reaction mixture as a mold release agent a preformed reaction product of an active hydrogen containing fatty acid ester and an organic monoisocyanate, said reaction product being soluble in said organic polyisocyanate.

11. The process of improving the mold release properties of a molded product obtained by reacting and shaping a foamable reaction mixture containing an organic polyisocyanate in a closed mold which comprises including as a mold release agent an effective amount of the preformed reaction product of an active hydrogen containing fatty acid ester and an excess of an organic monoisocyanate in the foamable reaction mixture, said reaction product being soluble in the organic polyisocyanate.

3,925,528

METHOD FOR PREPARING A COMPLETELY COVERED FOAM MOLDING

Karl-Heinz Müller, Leverkusen; Harry Röhr, Koenigsdorf, Cologne, and Karl-Heinz Ott, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

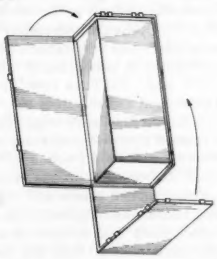
Filed June 13, 1972, Ser. No. 262,241

Claims priority, application Germany, June 15, 1971, 2129523

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² B29D *27/08*

U.S. Cl. 264—54 **5 Claims**



1. A process for producing a moulded article which comprises the steps of applying a vinyl chloride polymer containing a plasticizer to the internal surfces of a mould which is preheated to a temperature of from 30° to 150°C., thereafter completely filling the mould with granules of a thermoplastic or elasticthermoplastic polymer containing a blowing agent and heating the mould to a temperature of from 150° to 270°C. until the vinyl chloride polymer containing a plasticizer has formed a homogeneous covering layer and the thermoplastic or elastic-thermoplastic polymer has formed a foamed core having a uniform density of 0.2 to 0.8 g/cm³ or having zones of different uniform densities in the range of from 0.2 to 0.8 g/cm³, said core comprising

1. from 5 to 60 percent by weight of a rubbery elastic butadiene or isoprene polymer containing up to 50 percent by weight of copolymerized styrene, acrylonitrile or a lower alkyl ester of acrylic or methacrylic acid or a polyalkyl acrylate or a cis- or trans-polypentenamer or ethylene-propylene terpolymer containing not more than 10 percent by weight of ter-component and
2. from 95 to 40 percent by weight of polymerised (a) styrene, alkylstyrene, methyl methacrylate or mixtures thereof and (b) styrene, acrylonitrile, alkylacrylonitrile, methyl methacrylate or mixtures thereof in a proportion by weight of (a):(b) in the range of from 95:5 to 50:50, in which the monomers (2) have been completely or partially polymerised in the presence of polymer (1) and a residue of the monomers (2) has been added in the form of a separately made copolymer, and said covering layer comprising

a. from 30 to 85 percent by weight of a vinyl chloride copolymer containing up to 20 percent by weight of comonomers with a K-value according to Fikentscher of from 55 to 80, which is suitable for the preparation of a plastisol; or a mixture of from 90 to 30 percent by weight, of a vinyl chloride polymer which has a K-value of from 55 to 80 and a particle size of from 0.2 to 50 μ, and from 10 to 70 percent by weight of a vinyl chloride polymer which has a K-value of from 55 to 80 and a particle size of from 50 to 500μ and

b. from 70 to 15 percent by weight of a saturated or unsaturated monomeric plasticiser or mixtures thereof in which the vinyl chloride polymers are not completely soluble.

3,925,529

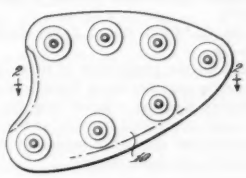
METHOD FOR MAKING SHOES WITH CLEATED BOTTOMS

Louis E. Bernier, Rockland, and James P. Giblin, Milton, both of Mass., assignors to E. T. Wright & Co., Inc., Rockland, Mass.

Division of Ser. No. 831,373, June 9, 1969, Pat. No. 3,587,181. This application Oct. 2, 1970, Ser. No. 77,672

Int. Cl.² B29H *7/08*

U.S. Cl. 264—244 **8 Claims**



1. The method of making a cleated bottom comprising providing cleats with heads of relatively large diameter from which stem shanks having first cylindrical portions next to the heads, second cylindrical portions of smaller diameter extending from the first cylindrical portions, tapered portions extending from the second cylindrical portions, and first conical shoulders at the junctions of the first and second cylindrical portions and second conical shoulders at the junctions of the second cylindrical portions and the tapered portions, supporting the cleats by means of the first conical shoulders within holes in the bottom of an open top mold containing a cavity of smaller area and depth than the bottom to be formed, forming a cleat plate of an elastomer about the portions of the cleats above said first shoulders within said mold cavity, removing the cleat plate from the mold cavity with the cleats attached thereto, supporting the cleat plate and the cleats attached thereto by means of the second conical shoulders within holes in the bottom of an open top mold containing a cavity corresponding in area and depth to the bottom to be formed, and forming a bottom of elastomer about the cleat plate and the cleats situated within the cavity above the bottom.

3,925,530
RELEASE COATING FOR MOLDS

Robert L. Rees, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 113,607, Feb. 8, 1971, abandoned.
This application Dec. 4, 1972, Ser. No. 312,139
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² B29C *1/04*
U.S. Cl. 264—297 **10 Claims**

1. A method of molding which comprises:

a. applying a mold release coating composition consisting essentially of polyphenylene sulfide in an amount within the range of from about **50** to about **90** parts by weight, polytetrafluoroethylene in an amount up to **10** parts by weight and a filler in an amount within the range of from about **10** to about **50** parts by weight said filler selected from the group consisting of titanium oxide, aluminum oxide, iron oxide and clay to the inner surface of a mold;

b. curing said coating;

c. introducing into said mold and into contact with the cured coating a polymeric composition moldable at a temperature less than that temperature at which the mold release coating composition becomes inoperable as a satisfactory coating;

d. molding said moldable polymeric composition;

e. removing said moldable polymeric composition from said mold as a molded object; and

f. repeating steps (c), (d), and (e) to produce a multiplicity of molded objects.

3,925,531
PRODUCTION OF TITANIUM TETRAHALIDE

John Hickman Moss, Middlesbrough, and Barrie Leng, Hartlepool, both of England, assignors to British Titan Limited, Billingham, Teeside, England

Filed Apr. 9, 1973, Ser. No. 349,454
Claims priority, application United Kingdom, June 27, 1972, 29944/72
Int. Cl.² C01G *23/02, 23/06, 49/06*
U.S. Cl. 423—76 **17 Claims**

1. A process for the production of titanium tetrafluoride comprising heating together ferric fluoride and an iron-containing titaniferous material selected from the group consisting of ferric oxide containing ilmenite and ferric oxide containing leucoxene and thereafter separately recovering titanium tetrafluoride and ferric oxide.

3,925,532
PROCESS FOR MANUFACTURING ALUMINUM SULFATE

Kenneth F. Griffiths, 21 N. Chatsworth Ave., Larchmont, N.Y. 10538

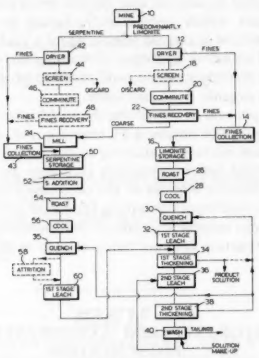
Filed Feb. 11, 1974, Ser. No. 441,128
Int. Cl.² C01F *7/74*
U.S. Cl. 423—132 **18 Claims**

1. A process for the production of a substantially pure aluminum sulfate comprising the steps of contacting in a reaction zone solid aluminum containing metallic impurities, simultaneously with an aqueous solution of sulfuric acid and a pool of liquid mercury maintaining said aluminum in contact with said mercury pool, said mercury being operative to cause the rapid dissolution of said solid aluminum and sulfuric acid to liberate the metallic impurities and the hydrogen therein, maintaining said contact for a period of time sufficient to convert said aluminum and sulfuric acid into aluminum sulfate, free said hydrogen and cause the metallic impurities freed from said aluminum to be absorbed by said mercury.

3,925,533
PROCESS FOR TREATING NICKELIFEROUS LATERITE ORE CONTAINING LIMONITE AND SERPENTINE FRACTIONS

Donald Robert Weir, Fort Saskatchewan, and David John Ivor Evans, North Edmonton, both of Canada, assignors to Sherritt Gordon Mines Limited, Ontario, Canada

Filed Dec. 6, 1973, Ser. No. 422,214
Claims priority, application Canada, Oct. 29, 1973, 184513
Int. Cl.² C01G *53/12*
U.S. Cl. 423—150 **6 Claims**



1. A process for extracting nickel from nickeliferous laterite ore composed of limonitic and serpentinic ore particles which comprises: dividing said particles into a first fraction consisting predominantly of limonite ore and a second fraction consisting predominantly of serpentine ore; mixing with said second fraction a sulphur-bearing additive in an amount sufficient to provide a sulphur content in the mixture of between about 0.2 and about 5% by weight; separately roasting in the presence of reducing gases said first fraction and said additive containing second fraction at temperatures within the ranges of 1150°F. to 1350°F. and 1200°F. to 1600°F. respectively in order to convert contained nickel values to a crude metallic state; separately passing to first leach stages said roasted first fraction and said roasted additive containing second fraction and separately leaching each said fraction with aqueous ammoniacal ammonium carbonate solutions in the presence of free oxygen to extract nickel values and dissolve them in solution; combining solution and undissolved residue from the first leach stage containing said roasted first fraction with solution and undissolved residue from the first leach stage containing said roasted additive containing second fraction and passing said combined solution and undissolved residue to a liquidsolids separation operation; removing solution from said liquidsolids separation operation and recovering at least a portion thereof as product liquor while recycling any remaining unrecovered solution to the first leach stage for said roasted first fraction; passing undissolved residue removed from said liguid-solids separation operation to a second leach stage and leaching same with an aqueous ammoniacal ammonium carbonate solution in the presence of free oxygen to extract nickel values and dissolve them in solution; removing solution from said second leach stage and recycling a sufficient portion thereof to said first leach stage for said roasted additive containing second fraction to provide make-up solution therefor and recycling any remaining said solution to said first leach stage for said roasted first fraction.

3,925,534

TREATMENT OF CEMENT KILN FLUE DUST

Frank Henry Singleton, Croydon, and Jack William Bruce, Lindfield, both of England, assignors to Woodall-Duckham, Limited, Crawley, England

Filed Sept. 4, 1973, Ser. No. 393,805
Claims priority, application United Kingdom, Sept. 4, 1972, 40939/72
Int. Cl.² C01F *11/18*; C01D *3/04*, *5/00*; C22B *7/02*
U.S. Cl. 423—208 10 Claims

1. A process of treating cement kiln flue dust, said dust containing lime and the chloride and sulphate salts of sodium and potassium, said process comprising:

a. in a first stage, forming a slurry in a first vessel by mixing the dust with fresh water at a temperature within the range of 40° to 90°C. for about 5 to 20 minutes to dissolve substantially all of the sodium and potassium chlorides, while simultaneously contacting the slurry with a carbon dioxide containing gas so as to convert, to insoluble calcium carbonate, substantially all of the soluble lime and the lime solubilized upon dissolution of the said chlorides;

b. in a second stage, treating in a second vessel the slurry of said first stage with additional water at a temperature within the range of 70° to 100°C. for between 30 minutes and 3 hours to dissolve substantially all of the sodium and potassium sulphates, while simultaneously contacting the slurry with a carbon dioxide containing gas so as to convert substantially all of the lime that is solubilized upon dissolution of the said sulphates to insoluble calcium carbonate; and

c. filtering the slurry from said second stage to obtain an insoluble residue and a liquid filtrate containing dissolved chloride and sulphate salts of sodium and potassium.

3,925,535

CATALYTIC PRODUCT FOR THE OXIDATIVE DESTRUCTION OF GASEOUS ORGANIC COMPOUNDS AND METHOD FOR THEIR PREPARATION

Christian Belliot; Etienne Cheylan; Serge Madelaine, and Johannes Ebbing, all of Paris, France, assignors to Compagnie Francaise Thomson Houston-Hotchkiss Brandt, Paris, France

Continuation of Ser. No. 203,833, Dec. 1, 1971, abandoned. This application Mar. 12, 1974, Ser. No. 450,348
Claims priority, application France, Dec. 1, 1970, 70.43189
Int. Cl.² B01J *8/00*, *10/00*
U.S. Cl. 423—213.2 13 Claims

1. A method for the oxidative destruction of gaseous organic compounds consisting of passing gaseous organic compounds and at least a five-fold excess of air at a temperature from about 180° to about 800° C over a catalyst consisting essentially of from about 50 to about 80% by weight of catalyst components consisting of from about 50 to about 85% by weight of manganese oxides, substantially in the rhombohedral form; up to about 30% by weight of manganous carbonate; from about 3 to about 10% by weight of cupric oxide and up to about 15% by weight of nickel oxides and from about 50 to about 20% by weight of cold-shapable refractory excipient.

3,925,536

METHOD OF RECOVERING URANIUM HEXAFLUORIDE

Seymour Schuman, Nutley, N.J., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 19, 1947, Ser. No. 755,755
Int. Cl.² C01G *43/06*
U.S. Cl. 423—258 9 Claims

1. A method of recovering uranium hexafluoride from gaseous mixtures which comprises adsorbing said uranium hexafluoride on activated carbon.

3,925,537

METAL BORACITES

Tom Allen Bither, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 181,605, Sept. 17, 1971, Pat. No. 3,801,703. This application Nov. 9, 1973, Ser. No. 414,288
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² C01B *35/00*, *9/08*
U.S. Cl. 423—277 8 Claims

1. Metal boracites of the formula

$$M_3B_7O_{13}F$$

wherein M is at least one divalent ion of Mg, Cr, Mn, Fe, Co, Zn or Cd.

3,925,538

PROCESS FOR PRODUCING ALUMINA MONOHYDRATE FROM BASIC ALUMINUM NITRATES

Charles P. Bruen, Basking Ridge, and Donald H. Kelly, Gladstone, both of N.J., assignors to Reynolds Metals Company, Richmond, Va.

Division of Ser. No. 48,919, June 18, 1970, Pat. No. 3,864,462. This application Nov. 6, 1974, Ser. No. 521,381
Int. Cl.² C01B *21/42*; C01F *7/30*
U.S. Cl. 423—390 1 Claim

1. In a process for recovering alumina monohydrate and aluminum nitrate from basic aluminum nitrates prepared by melting aluminum nitrate nonahydrate, partially denitrifying said molten aluminum nitrate nonahydrate by heating it to a temperature above its decomposition temperature but not above about 235°C. under superatmospheric pressure of at least about 25 psig and sufficient to maintain said decomposition temperature, while removing gaseous nitric acid decomposition products until between about 45% and about 55% of the HNO_3 of the aluminum nitrate nonahydrate has been removed, the steps which comprise

1. adding to a basic aluminum nitrate having the empirical formula

$$Al_2O_3 \cdot xAl(NO_3)_3 \cdot yH_2O$$

wherein X is a numeral from 0.667 to 6,0 inclusive, and Y is a numeral from 4 to 38 inclusive, about 7.2 moles H_2O to about 28.2 moles H_2O per mole of NO_3 in said basic aluminum nitrate to provide an aqueous solution having in solution a nitrate concentration between about 10 percent and about 25 percent by weight calculated as NO_3, respectively, (2) heating said diluted solution to a temperature between about 180°C and about 235°C. under autogenous pressure for a period sufficient to convert the basic aluminum nitrate to solid alumina monohydrate and dissolved aluminum nitrate wherein oxides of nitrogen released therefrom are substantially N_2O_5, (3) recovering the solid alumina monohydrate by separating the same from the solution, (4) recycling the separated solution to a succeeding aluminum nitrate dentrification step, whereby a steady state is established wherein recovery of both alumina and nitric acid is high, and (5) recovering approximately 99.5% of the HNO_3 originally present in said aluminum nitrate nonahydrate.

3,925,539

PROCESSES OF SYNTHESIZING ANHYDROUS LITHIUM HEXAFLUOROARSENATE

Dayal T. Meshri, and Darrell L. Westfall, both of Sand Springs, Okla., assignors to Ozark-Mahoning Company, Tulsa, Okla.

Filed July 12, 1974, Ser. No. 487,976
Int. Cl.² C01B *27/00*, *27/02*; C01D *15/00*
U.S. Cl. 423—464 19 Claims

1. A process of producing anhydrous $LiAsF_6$ (lithium hexafluoroarsenate) comprising the steps of:

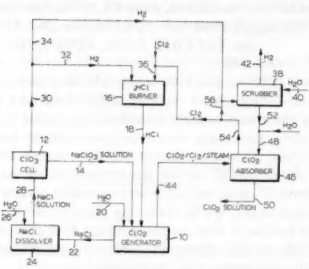
1. adding dry lithium fluoride to AsF_3 in a reaction vessel, thereby obtaining a milky solution of LiF in AsF_3,
2. thereafter adding to said solution anhydrous HF to obtain a clear solution comprising a mixture of LiF, anhydrous HF and AsF_3 in said reaction vessel,

3. flowing gaseous AsF_5 through the mixture in the reaction vessel until the contents thereof are saturated with AsF_5,
4. closing the reaction vessel and letting the AsF_5 saturated mixture stand therein until the reaction is completed, and
5. thereafter passing an inert gas into the reactor with all volatile materials (including AsF_5, HF and AsF_3) are removed therefrom and white crystals of $LiAsF_6$ remain behind in the reaction vessel.

3,925,540
PRODUCTION OF CHLORINE DIOXIDE

David G. Hatherly, 14 Regina Place, St. Johns, Newfoundland, Canada

Continuation of Ser. No. 150,600, June 7, 1971, abandoned. This application Sept. 30, 1974, Ser. No. 510,607
Claims priority, application Canada, June 10, 1970, 85091
Int. Cl.[2] C01B *11/02, 11/14, 1/02, 7/01*
U.S. Cl. 423—478 **12 Claims**



1. A method of forming chlorine dioxide which includes:
electrolyzing an aqueous solution of an alkali metal chloride to form an alkali metal chlorate and hydrogen in accordance with the equation:

$$MCl + 3H_2O \rightarrow MClO_3 + 3H_2$$

where M is an alkali metal,
providing said formed alkali metal chlorate as an aqueous solution thereof and forwarding said aqueous solution to a reaction zone,
separating said hydrogen into a first stream containing approximately one-third of the mole of quantity of said hydrogen and a second stream containing approximately two-thirds of the mole quantity of said hydrogen,
recovering said second stream of hydrogen,
reacting the hydrogen in said first stream thereof with chlorine to form hydrogen chloride in accordance with the equation:

$$H_2 + Cl_2 \longrightarrow 2HCl,$$

forwarding said hydrogen chloride to said reaction zone to provide with said forwarded aqueous solution of alkali metal chlorate an aqueous reaction medium in said reaction zone containing alkali metal chlorate and hydrochloric acid,
controlling the quantity of hydrochloric acid present in said reaction medium to provide an acidity of about 0.05 to below 1 normal therein,
heating the aqueous reaction medium to an elevated temperature corresponsing to its boiling point at the absolute pressure of said reaction zone and below the temperature above which substantial decomposition of chlorine dioxide occurs,
effecting reaction between said alkali metal chlorate and hydrochloric acid in said reaction medium at said elevated temperature while maintaining said reaction zone under subatmospheric pressure to form chlorine dioxide and chlorine predominantly in accordance with the equation:

$$MClO_3 + 2HCl \rightarrow ClO_2 + \tfrac{1}{2}Cl_2 + MCl + H_2O$$

where M is an alkali metal,
evaporating water from said reaction medium at said elevated temperature and forming in said reaction zone a gaseous admixture consisting essentially of said formed chlorine dioxide and chlorine and evaporated water,
removing said gaseous admixture from said reaction zone,
saturating said reaction medium with alkali metal chloride formed in said chlorine dioxide and chlorine-producing reaction and thereafter depositing alkali metal chloride from said reaction medium in said reaction zone.

3,925,541
METHOD OF COATING STABILIZED ERYTHROCYTES

Arthur Atsunobu Hirata, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 117,737, Feb. 22, 1971, abandoned, which is a continuation-in-part of Ser. No. 760,052, Sept. 16, 1968, abandoned, which is a continuation-in-part of Ser. No. 682,550, Nov. 13, 1967, abandoned. This application Nov. 8, 1972, Ser. No. 304,677The portion of the term of this patent subsequent to Jan. 30, 1990, has been disclaimed.
Int. Cl.[2] A01N *1/00;* **G01N** *31/00, 33/16*
U.S. Cl. 424—12 **6 Claims**

1. A method of coating stabilized double aldehyde-treated erythrocytes wherein said erythrocytes have been stabilized by (a) preparing a suspension of washed erythrocytes in a neutral buffered solution, (b) treating said erythrocyte suspension with from 1.5 to 5.0% by volume of pyruvic aldehyde per volume of erythrocytes for from 12 to 24 hours at room temperature, (c) washing the pyruvic aldehyde-treated erythrocyte suspension with said buffered solution to remove the excess pyruvic aldehyde, (d) treating the washed pyruvic aldehyde treated erythrocyte suspension with from 1.5 to 5.0% by volume of formaldehyde for from 12 to 24 hours and (e) washing the resulting stabilized erythrocytes with said buffered solution to remove the excess formaldehyde, said method comprising the step of adsorbing a substance selected from the group consisting of antigens or antibodies onto said erythrocytes.

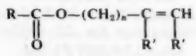
3,925,542
HAIR LACQUER AND WAVE SETTING COMPOSITIONS CONTAINING VINYL ACETATE-CROTONIC ACID-CONTAINING POLYMERS

Andre Viout, and Regine Pasero, both of Paris, France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Continuation-in-part of Ser. No. 747,470, July 25, 1968, Pat. No. 3,716,633, which is a continuation-in-part of Ser. Nos. 655,770, July 25, 1967, Pat. No. 3,579,629, and Ser. No. 530,395, Feb. 28, 1966, abandoned. This application Nov. 24, 1972, Ser. No. 309,502
Claims priority, application France, Mar. 3, 1965, 65.7787; Jan. 27, 1966, 66.47441; Aug. 3, 1966, 66.71998; Luxemburg, May 28, 1967, 54202The portion of the term of this patent subsequent to May 18, 1988, has been disclaimed.
Int. Cl.[2] A61K *7/11*
U.S. Cl. 424—47 **12 Claims**

6. A pressurized sprayable aerosol hair lacquer composition comprising a solution of 1–4% by weight of a salt of an amine base and a copolymer in a mixture of ¼ to ⅓ by weight of a solvent -butenoic from the group consisting of ethanol and isopropanol and ⅔ to ¾ by weight of an aerosol propellant selected from the group consisting of trichlorofluoromethane, dichlorodifluoromethane and their mixtures, said copolymer being selected from the group consisting of copolymers consisting essentially of (1) 50 to 90% by weight of a monomer

selected from the group consisting of vinyl acetate, vinyl propionate, allyl acetate and vinyl butyrate, (2) 5 to 25% by weight of a monomer selected from the group consisting of crotonic acid, 3-cutenoic acid, 4-pentenoic acid, allyloxyacetic acid, and allyloxypropionic acid and (3) 5 to 30% by weight of a monomer selected from the group consisting of lanolin crotonate, oleyl crotonate, 1-allyloxy-3-dodecyloxy-2-propanol, 1-allyloxy-3-dodecylthio-2-propanol, 1-octene, 1-hexadecene, allyl oleate, stearyl vinyl ether and an ester of the formula:



wherein R is linear alkyl having 8 to 18 carbon atoms, *n* is 0 – 1 and R′ is selected from the group consisting of hydrogen and methyl.

3,925,543

ANTIBACTERIAL ORAL COMPOSITIONS CONTAINING PRESERVATIVE-ANTIOXIDANTS

John Donohue, Neshanic, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Nov. 1, 1973, Ser. No. 411,706
Int. Cl.² A61K *7/16, 7/18, 7/22*
U.S. Cl. 424—52 **11 Claims**

1. An oral dental plaque and stain formation preventing preparation consisting essentially of an aqueous vehicle having a pH in the range of about 4.5 to about 7 which aqueous vehicle contains from about 0.01 percent to 5 percent by weight of a non-toxic water-soluble bis-biguanido hexane compound as antibacterial dental plaque formation preventing agent which is selected from the group consisting of 1,6-di-(p-chlorophenyl biguandio) hexane, 1,6-bis-(2-ethylhexyl biguanido) hexane and salts thereof, and about 0.1 percent to 5 percent by weight of ascorbic acid as a stabilizing agent which is effective to inhibit dental stain formation otherwise caused by said antibacterial agent at levels established as effective for plaque reduction.

3,925,544

BOVINE VACCINES AND METHODS OF MAKING AND USING SAME

Isaac L. Shechmeister; Joseph R. Kolar, Jr., and William G. Kammlade, Jr., all of Carbondale, Ill., assignors to Southern Illinois University Foundation, Carbondale, Ill.

Division of Ser. No. 161,701, July 12, 1971, abandoned, which is a division of Ser. No. 8,631, Feb. 4, 1970, Pat. No. 3,629,413. This application Dec. 27, 1973, Ser. No. 428,658
Int. Cl.² A61K *27/12*
U.S. Cl. 424—89 **3 Claims**

1. A vaccine comprising a suspension of 1 to 5 percent weight/volume of a soluble alginate adjuvant vehicle suitable for parenteral injection and an admixed volume of an aqueous solution containing a final concentration of between about 0.3percent and 0.5 percent formaldehyde and formalin-killed bovine viral diarrhea virus in a concentration of 10^5–10^8 $TCID_{50}$/ml. which has been maintained at a temperature of about 4°C. for approximately 1 week.

3,925,545

PROCESS FOR PREPARING ADSORBED VACCINES

Edgar Hans Relyveld, Paris, France, assignor to Institut Pasteur, Paris, France

Filed Mar. 20, 1973, Ser. No. 342,932
Claims priority, application France, Apr. 6, 1972, 72.12036
Int. Cl.² A61K *39/02, 39/06, 39/12, 39/16*
U.S. Cl. 424—92 **7 Claims**

1. In the method of preparing a composition including a vaccine in an adsorbed state, by contacting an aqueous vaccine with an aqueous gel formed by pouring a calcium chloride aqueous solution having a concentration of 0.01 M to 0.5 M into an aqueous solution of dibasic sodium phosphate having a concentration of 0.01 M to 0.5 M, in a proportion substantially equal to 1 mol of PO_4HNa_2 per mol of $CaCl_2$, under stirring, the mixture thus obtained being further stirred while its pH is adjusted to a value of 6.8 to 7.2, and the gel formed being subsequently decanted and washed, the improvement which comprises carrying out said pouring of the calcium chloride solution as rapidly as possible within less than 3 minutes.

3,925,546

ANTIBIOTIC NO. 156-B1 AND PROCESS FOR PRODUCTION THEREOF

Yukiji Shimojima, Tokyo, Japan; Isao Takeda, deceased, late of Japan; by Emiko Takeda, legal representative, Osaka, Japan; Masayuki Mizuno, Miyazaki, Japan; Yukiko Mizuno, Minamiohoizumi, Japan, and Tadaaki Ohoka, Ohoi, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 336,459, Feb. 28, 1973, abandoned. This application May 14, 1974, Ser. No. 469,778
Claims priority, application Japan, Mar. 3, 1972, 47-21542
Int. Cl.² A61K *35/00*
U.S. Cl. 424—116 **3 Claims**

1. Antibiotic No. 156-B1 having an elementary analysis of 34.9% C, 5.9% H, 18.1% N, 22.0% O and 14.93% Cl, an optical rotation of $[\alpha]_D^{18}$ −43.0° (1% in H_2O), a melting point of 200° – 203°C, a decomposition color of brown, a molecular weight of 480 by the vapor pressure osmotic method, and exhibiting the infrared absorption spectrul illustrated in FIG. **1**, or a pharmaceutically acceptable salt thereof selected from the group consisting of the hydrochloride, sulfate and acetate salts.

3,925,547

ISOLATION AND PURIFICATION OF ACTIVE PRINCIPLE OF FRUIT OF SYNSEPALUM DULCIFICUM

Robert I. Henkin, Bethesda, Md., and Eugene L. Giroux, Strasbourg, France, assignors to The United States of America as represented by the Secretary of Health, Education and Welfare, Washington, D.C.

Filed Apr. 24, 1973, Ser. No. 354,098
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² A61K *35/78*
U.S. Cl. 424—195 **4 Claims**

1. A process for obtaining the active principle of the fruit of the plant *Synsepalum dulcificum* which comprises:

a. contacting the fruit of *Synsepalum dulcificum* with a suspension of polyvinyl pyrrolidone in a basic medium;
b. filtering the suspension to obtain a supernatant containing the active principle of the fruit;
c. adding ξ-amino caproic acid to the supernatant;
d. acidifying the supernatant to reduce the pH to the range of 6.0 – 6.5;
e. filtering the supernatant to obtain a solution of the active principle;
f. adsorbing the active principle on at least one chromatographic column, with at least one column employing a support material selected from the group consisting of cellulose and polyacrylamide - based strongly basic anion exchangers; and
g. eluting the active principle with a buffered solution of Na_2HPO_4 to recover the active principle from the column.

3,925,548
1-SUBSTITUTED-4-ARYL-2(1H)-QUINAZOLINONES AS PHARMACEUTICAL AGENTS

Hans Oh, Pfeffingen, Switzerland, assignor to Sandoz, Inc., E. Hanover, N.J.

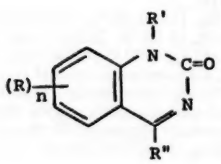
Division of Ser. No. 775,201, Nov. 12, 1968, Pat. No. 3,723,432, which is a continuation-in-part of Ser. No. 741,804, July 1, 1968, abandoned, which is a continuation-in-part of Ser. No. 707,932, Feb. 26, 1968, abandoned, which is a continuation-in-part of Ser. No. 672,739, Oct. 4, 1967, abandoned, which is a continuation-in-part of Ser. No. 636,015, May 4, 1967, abandoned, which is a continuation-in-part of Ser. No. 575,511, Aug. 29, 1966, abandoned. This application Dec. 8, 1972, Ser. No. 313,531The portion of the term of this patent subsequent to Sept. 12, 1992, has been disclaimed.

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] A61K *31/505*

U.S. Cl. 424—251 **46 Claims**

24. A pharmaceutical composition for treating inflammation and/or pain in animals comprising an inert pharmaceutically acceptable carrier and an inflammation and/or pain treating effective amount of a compound of the formula:



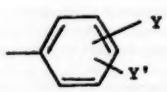
wherein

R represents hydrogen, halo, lower alkyl, hydroxy, lower alkoxy, nitro, amino, acetamido, mercapto, cyano, trifluoromethyl, lower alkylthio, N-(lower)alkylamino or di(lower)alkylamino;

n is 1 or 2, and when 2 then: A) one and the other R is, independently, halo, lower alkyl or lower alkoxy, or one R is from the group of halo, lower alkyl and lower alkoxy and the other R is from the group of nitro, amino, N-(lower)alkylamino or di(lower)alkylamino or B) one R is N-(lower)alkylamino or di(lower)alkylamino while the other R is nitro;

R′ represents lower alkyl, allyl, methallyl or propargyl; provided R′ is not an unsaturated hydrocarbon substituent when R is N-alkylamino;

R″ represents phenyl or substituted phenyl of the formula



Y represents halo, hydroxy, lower alkyl, lower alkoxy or trifluoromethyl, and

Y′ represents hydrogen, halo, hydroxy, lower alkyl or lower alkoxy

or a pharmaceutically acceptable acid addition salt thereof.

3,925,549
1-SUBSTITUTED-QUINAZOLINE-2(1H)-THIONES IN THE TREATMENT OF INFLAMMATION

Hans Ott, Basel-Land, Switzerland, assignor to Sandoz, Inc., E. Hanover, N.J.

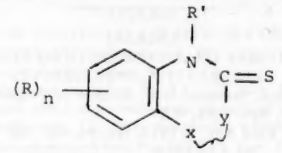
Division of Ser. No. 78,587, Oct. 6, 1970, Pat. No. 3,764,600, which is a continuation of Ser. No. 819,477, April 25, 1969, which is a continuation-in-part of Ser. No. 741,805, July 1, 1968. This application June 11, 1973, Ser. No. 368,862The portion of the term of this patent subsequent to Sept. 12, 1992, has been disclaimed.

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] A61K *31/505*

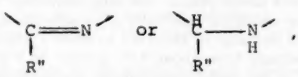
U.S. Cl. 424—251 **19 Claims**

11. A pharmaceutical composition comprising an inert pharmaceutically acceptable carrier and an anti-inflammatory treating effective amount of a compound of the formula:



wherein

$\overline{x\ y}$ is either



R is, independently, hydrogen; halo having an atomic weight no greater than 80; lower alkyl; lower alkoxy; nitro; cyano; lower alkylthio; trifluoromethyl; or di(lower)alkylamino;

n is 1 or 2, and when 2 then one and the other R is, independently, halo, lower alkyl or lower alkoxy, or the other R is di(lower)alkylamino;

R′ is lower alkyl; allyl; methallyl; or propargyl;

R″ is phenyl; or substituted phenyl of the formula:

Y represents halo (as defined above); lower alkyl; lower alkoxy; or trifluoromethyl; and

Y″ represents hydrogen, halo (as defined above); lower alkyl; or lower alkoxy.

3,925,550
1-(5-NITROTHI-ALZOL-2-YL)-IMIDAZOLIDINE-2-THIONE HAVING ANTI-PARASITIC AND ANTI-MICROBIAL PROPERTIES

Serge Tchelitcheff, Thiais, France, assignor to Rhone-Poulenc S.A., Paris, France

Division of Ser. No. 236,579, March 21, 1972, Pat. No. 3,810,908. This application July 20, 1973, Ser. No. 381,083 Claims priority, application France, Mar. 23, 1971, 71.10150

Int. Cl.[2] A61K *27/00*

U.S. Cl. 424—270 **4 Claims**

1. A method for combatting bilharzioses due to *Schistosoma mansoni, Schistosoma haematobium* or to *Schistosoma japonicum*, in a patient which comprises administering to the patient 1-(5-nitrothiazol-2-yl)-imidazolidine-2-thione in an amount sufficient to improve the condition of the patient.

3,925,551

2-SUBSTITUTED PHENYLHYDRAZONOIMIDAZOLENINE FUNGICIDAL AND BACTERICIDAL AGENTS

Karl Heinz Buchel, Wuppertal-Elberfeld; Paul-Ernst Frohberger; Hans Scheinpflug, both of Leverkusen, and Edgar Enders, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 12, 1972, Ser. No. 261,828

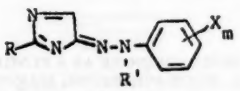
Claims priority, application Germany, June 15, 1971, 2129524

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] A01N 9/22

U.S. Cl. 424—273 9 Claims

1. A method of combating pests selected from the group consisting of fungi and bacteria which comprises applying to said pests or their habitat a fungicidally or bactericidally effective amount of a compound of the formula



in which

R is alkyl of up to 6 carbon atoms,

R′ is a member selected from the group consisting of hydrogen, lower alkylcarbonyl, lower alkoxycarbonyl, lower alkylsulfonyl, phenylcarbonyl, phenoxycarbonyl and phenylsulfonyl,

X is a member selected from the group consisting of halogen, trifluoromethyl, nitro, lower alkyl, lower alkoxy, lower alkylthio, lower alkylamino and di-lower alkylamino, said lower alkyl and lower alkoxy radicals in R_1 and X having up to 6 carbon atoms and

m is 0 to 3.

3,925,552

PHARMACEUTICAL COMPOSITIONS CONTAINING 1-CARBOXAMIDINE PYROZOLES AND THEIR ACID ADDITION SALTS AND USE OF SAME

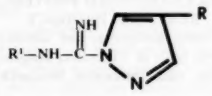
Isaac Karadavidoff, and Michele Moreau, both of Paris, France, assignors to Fuveau S.A., Paris, France

Division of Ser. No. 247,833, April 26, 1972, Pat. No. 3,833,605. This application Sept. 26, 1973, Ser. No. 400,733

Int. Cl.[2] A61K 31/415

U.S. Cl. 424—273 8 Claims

1. A pharmaceutical composition for use as an anti-inflammatory or analgesic agent which contains an effective amount of a compound of the formula:



in which R is hydrogen or lower alkyl and R^1 is hydrogen, lower alkyl or benzyl, or an acid addition salt thereof, with a pharmaceutically acceptable inorganic or organic acid, and a pharmaceutically acceptable carrier.

3,925,553

HERBICIDAL AND/OR FUNGICIDAL 5-POLYHALOETHYLIMINO- AND 5-POLYHALOVINYLIMINO-2,4-IMIDAZOLIDINEDIONES

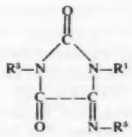
Malcolm S. Singer, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 239,357, March 29, 1972, Pat. No. 3,822,282. This application Mar. 27, 1974, Ser. No. 455,167

Int. Cl.[2] A01N 9/22

U.S. Cl. 424—273 11 Claims

1. A method of controlling fungi which comprises applying thereto a fungicidally effective amount of a compound of the formula



wherein one of R^1 or R^3 independently is alkyl of from 1 to 4 carbon atoms, and the other R^1 or R^3 is alkenyl of 3 to 6 carbon atoms, naphthyl, phenyl, halo-substituted phenyl of from 1 to 4 halogens of atomic number 9 to 35, alkphenyl of 7 to 12 carbon atoms, or halo-substituted alkphenyl of 7 to 12 carbon atoms and of from 1 to 4 halogens of atomic number 9 to 35 or from 1 to 2 alkoxy of 1 to 4 carbon atoms; and R^5 is 1-hydroxy-2,2,2-trihaloethyl, 1,2,2,2-tetrahaloethyl, trihalovinyl or dihalovinyl wherein the halogen is of atomic number 17 to 35.

3,925,554

CERTAIN 3,5-DICHLOROPHENYL COMPOUND USED AS A PLANT FUNGICIDE

Nobumasa Tottori, Minoo; Toshiro Kato, Amagasaki; Yasuhisa Asano, Ooita; Minoru Ueda; Osamu Kirino, both of Takarazuka; Shigehiro Ooba, Kobe; Akira Fujinami, Ashiya, and Toshiaki Ozaki, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

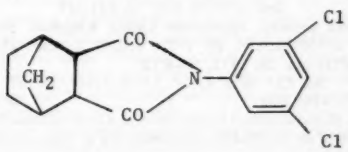
Filed Nov. 6, 1973, Ser. No. 413,326

Claims priority, application Japan, Nov. 30, 1972, 47-120436; Nov. 30, 1972, 47-120437

Int. Cl.[2] A01N 9/22

U.S. Cl. 424—274 16 Claims

1. A method for killing phyto-pathogenic fungi on plants which comprises applying to said fungi a fungicidally effective amount of a 3,5-dichlorophenyl compound of the formula



3,925,555
METHOD OF CONTROLLING MITES USING CHLOROMETHANESULFONAMIDE

Itsuki Okuda, Shimizu; Hiroshi Shinohara; Haruki Ogawa, both of Shizuoka, and Hideo Itoh, Shimizu, all of Japan, assignors to Kumiai Chemical Industry Co,, Tokyo, Japan

Continuation-in-part of Ser. No. 341,367, March 15, 1973, Pat. No. 3,795,743, which is a continuation of Ser. No. 13,204, Feb. 20, 1970, abandoned. This application Dec. 10, 1973, Ser. No. 423,198The portion of the term of this patent subsequent to Mar. 5, 1991, has been disclaimed.

Int. Cl.² A01N 9/16

U.S. Cl. 424—321 **2 Claims**

1. A method for killing mites, which comprises spraying a solution containing 250–1000 ppm of chloromethanesulfonamide on plants infested by mites.

3,925,556
ANTI MICROBIAL COMPOSITIONS CONTAINING UNSYMMETRICAL OLIGOQUATERNARY AMMONIUM COMPOUNDS

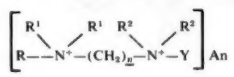
Robert Andrew Bauman, New Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 185,388, Sept. 30, 1971, abandoned, which is a division of Ser. No. 82,594, Oct. 21, 1970, abandoned, which is a continuation-in-part of Ser. No. 716,412, March 27, 1968, abandoned. This application Sept. 17, 1974, Ser. No. 506,807

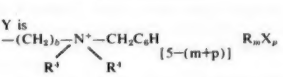
Int. Cl.² A61K 7/22, 31/14

U.S. Cl. 424—329 **14 Claims**

1. An antimicrobial composition comprising about 0.1–10% by weight of an unsymmetrical poly-onium quaternary ammonium compound having the structural formula:



wherein R is a substantially straight chain alkyl group having 10 to 18 carbon atoms,



n is an integer 2 to 18;

R^1, R^2, R^3 and R^4 are lower alkyls having 1 to 3 carbon atoms;

b is an integer 2 to 12;

X is selected from the group consisting of chlorine, bromine and iodine;

m is 0 to 3;

p is 0 to 3;

m+*p* is 0 to 3;

and

An is a compatible anion and a compatible inert pharmaceutical carrier therefor.

3,925,557
ANTI-ALLERGIC PHARMACEUTICAL COMPOSITIONS

Derek Richard Buckle, Redhill, and Harry Smith, Maplehurst near Horsham, both of England, assignors to Beecham Group Limited, United Kingdom

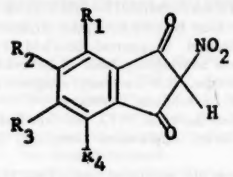
Division of Ser. No. 317,296, Dec. 21, 1972. This application Dec. 3, 1973, Ser. No. 421,239

Claims priority, application United Kingdom, June 20, 1972, 28707/72; Oct. 18, 1972, 48027/72; Mar. 22, 1972, 13300/72; Jan. 25, 1972, 3348/72

Int. Cl.² A61K 31/04, 31/12, 31/44, 31/135

U.S. Cl. 424—331 **24 Claims**

1. A pharmaceutical composition in a form suitable for oral, parenteral or insufflation administration to humans comprising an amount of a compound of the formula:



(I)

or a pharmaceutically acceptable nontoxic salt thereof, wherein R_1, R_2, R_3 and R_4 are each hydrogen, lower alkyl, aryl, aralkyl, or halogen, provided that R_1, R_2, R_3 and R_4 are not simultaneously hydrogen, sufficient to be effective for the prophylaxis or treatment of asthma or hay-fever, or the treatment or rhinitis, in combination with a pharmaceutically acceptable non-toxic inert diluent or carrier suitable for said administration form.

3,925,558
USE OF OBTUSAQUINONE AS A FUNGICIDE TO CONTROL WOOD-INHABITING MARINE FUNGI

John D. Bultman, Oxon Hill, Md.; Leonard Jurd, Berkley, Calif., and Donald D. Ritchie, New York, N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 25, 1974, Ser. No. 518,112

Int. Cl.² A01N 9/24

U.S. Cl. 424—331 **2 Claims**

1. A method of treating wood for preventing growth of fungus which comprises impregnating a fungicidal amount of obtusaquinone into said wood.

3,925,559
ANIMAL FEEDS FOR HERBIVOROUS DOMESTIC ANIMALS

Elmer F. Glabe, Northbrook; Perry W. Anderson, Niles, and Stergios Laftsidis, Chicago, all of Ill., assignors to Food Technology, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 300,736, Oct. 25, 1972, abandoned, which is a continuation-in-part of Ser. No. 158,616, June 30, 1971, abandoned. This application June 28, 1974, Ser. No. 484,080

Int. Cl.² A23K 3/00

U.S. Cl. 426—2 **6 Claims**

1. A process of feeding herbivorous animals selected from the group consisting of cattle, pigs, horses, sheep, goats and fowl, which comprises feeding such animals with animal feed containing sodium diacetate in sufficient amount to serve as an attractant and to enhance the taste threshhold of said feed, the quantity of sodium diacetate added thereto being within the range of 0.1% to 1.5% by weight of the total feed, and said feed to which said sodium diacetate is added being selected from the group consisting of corn and mixed feeds containing at least 25% by weight of corn.

3,925,560
FEED SUPPLEMENTS FOR RUMINANTS COMPRISING LIPID ENCAPSULATED WITH PROTEIN-ALDEHYDE REACTION PRODUCT

Trevor William Scott, Kellyville, and Geoffrey Dean Loftus Hills, Beaumaris, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Australia

Filed May 14, 1973, Ser. No. 359,793

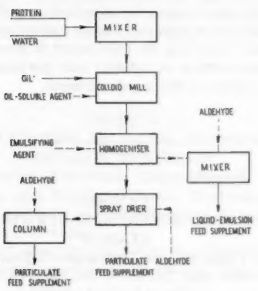
Int. Cl.² A23K 1/18

U.S. Cl. 426—2 **11 Claims**

1. In a method of feeding ruminant animals whereby a feed supplement comprises a nutritionally effective portion of the

ruminants' diet, the improvement of providing dietary lipid to said ruminant animals in effective nutritional amounts thereby permitting modification of said ruminant animals nutrition, fat, meat and milk production without causing digestive disturbances by the method comprising:

feeding said ruminant animals a composite feed supplement material made of dietary lipid which is assimilable by ruminant animals and encapsulated by a reaction product of dietary protein and aldehyde which is substantially insoluble at a pH greater than about 5 and substantially



soluble at a pH less than about 4 and therefore not degradable in the rumen but subject to degradation in the abomasum and lower gut, said dietary lipid consisting essentially of nutrient lipid globules of a size less than about 0.1 millimeter, said supplement being fed in a quantity which will supply said dietary lipid in said nutritional amounts for said ruminant animals; and allowing said supplement to be ingested by said ruminant animals and pass through the rumen and become digested in the abomasum and lower gut and thereby assimilated by said ruminant animals.

3,925,561

METHOD FOR IMPARTING COLOR TO TEXTURIZED VEGETABLE PROTEIN

Henk Herstel, and Godefridus Antonius Maria van den Ouweland, both of Zevenaar, Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Feb. 19, 1974, Ser. No. 443,552

Claims priority, application United Kingdom, Feb. 26, 1973, 9235/73

Int. Cl.² A23L *1/275*

U.S. Cl. 426—250 **5 Claims**

1. A process for imparting a brown color that will not be leached out with water and which is not associated with any noticeable odor or taste, to an extruded texturized vegetable protein product, which comprises incorporating in the mixture fed to an extruder wherein the protein-containing vegetable material is cooked and texturized at a temperature between 120° and 170°C, a proportion sufficient to impart said color in the texturized product but which is not more than 10% by weight, based on the amount of protein present, of a C_5 sugar or a phosphate ester of a C_5 sugar.

3,925,562

TEXTURIZING PROCESS FOR SINGLE CELL PROTEIN CONTAINING PROTEIN MIXTURES

Steven R. Tannenbaum, Framingham, Mass., assignor to Standard Oil Company, Chicago, Ill.

Continuation-in-part of Ser. No. 230,949, March 1, 1972, Pat. No. 3,845,222, which is a continuation-in-part of Ser. No. 32,387, April 27, 1970, abandoned. This application July 19, 1974, Ser. No. 490,037The portion of the term of this patent subsequent to Oct. 29, 1991, has been disclaimed.

Int. Cl.² A23J *3/00*

U.S. Cl. 426—276 **14 Claims**

1. A process for imparting texture to a mixture of microbial cells and vegetable protein comprising the steps of:

a. heating an aqueous paste of microbial cell material and vegetable protein to a temperature wherein the range from about 150° to about 400°F. for a time period within the range from about 10 to about 300 seconds, said paste containing from about 10 to about 50 wt. % water;

b. simultaneously applying a shearing force to said cell paste, the shearing force corresponding to a shear rate of about 10 to about 60 rpm and a torque of about 200 to about 2,000 meter-grams;

c. extruding the heated and sheared cell paste through a die to provide a shaped extrudate; and

d. exposing the shaped extrudate to an oxygen-containing gas stream to produce a product which is chewy, crunchy, crispy and resists dispersion in water.

3,925,563

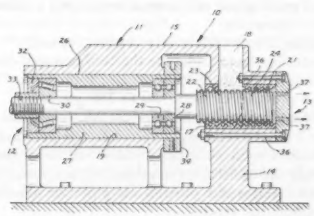
PREPARING AN EXTRUDED PUFFED SNACK PRODUCT

Robert O. Straughn; Gary L. Elofson, and Richard D. Reinhart, all of Minneapolis, Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed May 27, 1970, Ser. No. 40,979

Int. Cl. A23l *1/12*

U.S. Cl. 426—302 **8 Claims**



1. A method for preparing a puffed snack product resembling a French fried potato stick, said method comprising: dry blending a mixture including by weight at least 30% potato solids and up to 70% cereal meal; adding and thoroughly dispersing sufficient water in said dry blend to raise the total moisture content of the mixture to between 16 and 22%, by weight; working the mixture in an extruder under a controlled temperature of up to 340°F.; adjusting the mixture to a temperature in the range of between 255° and 340°F. and a pressure in the range of between 800 and **1500** pounds per square inch gauge and then extruding and expanding the mixture, said mixture expanding between 4 and 5.5 times upon extrusion; cutting the extruded mixture into pieces; toasting the pieces and enrobing the pieces with an edible oil and salt.

3,925,564

METHOD OF CURING AND DRYING WILD RICE

Ned W. Finnell, Route 4, Hayward, Wis. 54843

Filed July 22, 1974, Ser. No. 490,520
Int. Cl.[2] A23B *4/04*
U.S. Cl. 426—418 2 Claims

1. A method of dehulling wild rice kernels which comprises moistening said rice kernels at a temperature not greater than 55°F. to a moisture content of 45–50% on a weight basis, maintaining said rice kernels at a temperature not greater than 55°F. and at a moisture content of 45–50% for 7–21 days until the hulls of said kernels turn brown, drying said kernels to a moisture content of 6–8% on a weight basis, and thereafter dehulling said kernels to produce grain.

3,925,565

SIMULATED MEAT PRODUCT

Robert R. Reinhart, Des Plaines, and George M. Smith, Jr., Crystal Lake, both of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Continuation-in-part of Ser. No. 180,122, Sept. 13, 1971, abandoned. This application May 28, 1974, Ser. No. 473,569
Int. Cl.[2] A23J *3/00;* A23P *1/00*
U.S. Cl. 426—447 18 Claims

1. A process for preparing a puffed food product simulating meat comprising:

A. admixing a proteinaceous mixture of a protein material comprising a member selected from the group consisting of gelatin, microbiological protein, egg white, muscle protein, keratins, lactalbumin, and blood having protein concentrations of at least about 30 percent with water in an amount sufficient to provide a final moisture content of from about 25 percent to about 40 percent by weight;

B. subjecting the moistened proteinaceous mixture to a pressure above atmospheric pressure and a temperature above 212°F. to convert it into a flowable substance; C. extruding the flowable substance in a uniform linear flow as an extrudate into a medium of lower pressure without puffing the flowable substance, said extruding being accomplished in the form of an annular shape in which both the inside and outside of the annular flowable substance are cooled to a temperature below 212°F. in order to avoid puffing and said extrusion creating a translucent to glassy extrudate;

D. placing the extrudate in a confined space;

E. subjecting the extrudate in the confined space to a water-boiling temperature for a time of from 15 to 75 seconds and a pressure of from 150 to 250 psi; and

F. suddenly releasing the pressure on the extrudate in less than 2 seconds causing the extrudate to puff and resemble simulated meat with said sudden release of pressure removing the translucent to glassy characteristics and creating an exterior skin portion and a fibrous inner portion in the simulated meat.

3,925,566

SIMULATED MEAT PRODUCT

Robert R. Reinhart, Des Plaines, and Louis Sair, Evergreen Park, both of Ill., assignors to The Quaker Oats Company and The Griffith Laboratories, Inc., both of Chicago, Ill.

Continuation-in-part of Ser. Nos. 180,120, Sept. 13, 1971, abandoned, and Ser. No. 180,121, Sept. 13, 1971, abandoned. This application May 28, 1974, Ser. No. 473,570
Int. Cl.[2] A23J *3/00;* A23P *1/00*
U.S. Cl. 426—447 7 Claims

1. A process for preparing a puffed food product simulating meat comprising:

A. admixing a proteinaceous mixture having protein concentrations of at least about 30 percent with water in an amount sufficient to provide a final moisture content of from about 25 percent to about 40 percent by weight; said proteinaceous mixture comprising a protein material selected from the group oil seed vegetable proteins, casein and caseinate salts;

B. subjecting the moistened proteinaceous mixture to a pressure above atmospheric pressure and a temperature above 212°F to convert it into a flowable substance;

C. extruding the flowable substance in a uniform linear flow as an extrudate into a medium of lower pressure without puffing the flowable substance, said extruding being accomplished in the form of an annular shape in which both the inside and outside of the annular flowable substance are cooled to a temperature below 212°F in order to avoid puffing and said extrusion creating a translucent to glassy extrudate;

D. placing the extrudate in a confined space;

E. subjecting the extrudate in the confined space to a water-boiling temperature for a time of from 5 to 100 seconds and a pressure of from 100 psi to 250 psi; and

F. suddenly releasing the pressure in less than 2 seconds on the extrudate causing the extrudate to puff and resemble simulated meat with said sudden release of pressure substantially removing the translucent to glassy characteristics and creating an exterior skin portion and a fibrous inner portion in the simulated meat.

3,925,567

PROCESS FOR PREPARING SNACK-FOODS FROM STARCH

Shunji Abe, 1-Banchi Oaza Tsuchikawa, Ojiya, Niigata, Japan

Filed Mar. 26, 1974, Ser. No. 454,909
Int. Cl.[2] A21D *10/00*
U.S. Cl. 426—559 2 Claims

1. A process for preparing puffed snack food products from glutinous type starch which comprises mixing by kneading with steam for a period of time sufficient to produce a homogeneous cake material a glutinous type starch selected from the group consisting of glutinous rice starch, waxy corn starch, glutinous millet starch and glutinous kaoliang starch with at least 20% based on the weight of the mixture of a flour selected from the group consisting of rice flour and cereal flour, immediately thereafter rapidly cooling the mixture to a temperature sufficient to form a solidified material, shaping and forming the solidified material, into the desired shape drying said shaped and formed material and then baking the dried material under conditions sufficient to form the puffed snack food product.

3,925,568

PROCESS FOR FORTIFYING FOOD AND FEED PRODUCTS WITH AMINO ACIDS

Ganta V. Rao, and Oliver B. Gerrish, Sr., both of Hutchinson, Kans., assignors to Far-Mar-Co., Inc, Hutchinson, Kans.

Continuation-in-part of Ser. No. 291,341, Sept. 22, 1972, abandoned. This application Feb. 6, 1974, Ser. No. 439,860
Int. Cl.[2] A23L *1/20*
U.S. Cl. 426—618 21 Claims

1. A process for fortifying vegetable protein food products for human and animal consumption with amino acids comprising the steps of:

a. tempering said products in an aqueous solvent having a pH in the range from about 8 to 14 for a time sufficient to achieve the desired amino acid fortification, said solvent containing an alkaline catalyst and from 0.05 to 20 percent by weight of said amino acid based upon the weight of the untempered product, and

b. drying said tempered product to reduce the moisture level thereof.

3,925,569

WET PROCESS FOR MAKING BLANDER HIGH-PROTEIN SOYBEAN PRODUCTS

Rasik D. Daftary, Decatur, Ill., assignor to Archer Daniels Midland Company, Decatur, Ill.

Continuation-in-part of Ser. No. 245,920, April 20, 1972, abandoned. This application Apr. 2, 1973, Ser. No. 345,969

Int. Cl.[2] A23L *1/20*

U.S. Cl. 426—634 11 Claims

1. The process of producing a soybean material having the combined properties of bland flavor, high protein content with high protein dispersibility index, high fat content, and low flatulence, comprising soaking a full-fat soybean material in a liquid mixture of at least one aliphatic alcohol of 1–4 carbon atoms and water in a volume ratio of not more than 2:1 alcohol: water at a temperature of 0°–70°C and for a time at least sufficient for said liquid mixture to penetrate all of the soybean material, separating the soaking liquid from the soybean material, and recovering a soybean material containing substantially all of the fat in the original untreated soybean material.

3,925,570

METHOD OF COATING METALLIC MATERIAL ONTO A METALLIC SUBSTRATE

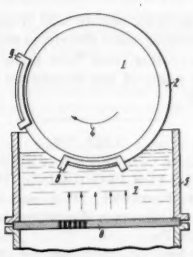
Friedhelm Reinke, Remscheid; Edgar Stengel, Wuppertal-Hahnerberg, and Friedhelm Emde, Huckeswagen, all of Germany, assignors to AEG-Elotherm G.m.b.H., Remscheid-Hasten, Germany

Filed Sept. 19, 1972, Ser. No. 290,384

Claims priority, application Germany, Sept. 30, 1971, 2148779

Int. Cl.[2] B05D *3/02*, *1/24*

U.S. Cl. 427—46 8 Claims



1. A method of applying a coating of metallic material to specified metal regions on a base material of a different metal comprising the steps of:

immersing at least the metal surface regions of the workpiece that are to be coated in a fluidized bed containing particles of the coating metallic material,

providing an ascending current of gas in said fluidized bed so that said coating particles are suspended,

inductively heating in the fluidized bed a surface layer of the workpiece in the regions that are to be coated in the fluidized bed so that said suspended material from the fluidized bed is deposited on said inductively heated regions and

inductively reheating the coated material outside the fluidized bed after deposition.

3,925,571

METHOD OF MAKING A SELENIUM CHARGE CARRIER PLATE

Karl Esser, Stein, and John E. Segain, Gunzenhausen, both of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 1, 1974, Ser. No. 438,831

Claims priority, application Germany, Feb. 8, 1973, 2306157

Int. Cl.[2] B44D *1/18*

U.S. Cl. 427—76 7 Claims

1. An improved method of preparing a selenium charge carrier foil for use in a copying machine wherein a non-conducting layer of selenium is evaporated onto a metal substrate wherein the improvement comprises:

spraying a layer of conductive lacquer onto a flexible charge carrier metal foil; and

evaporating a non-conducting layer of selenium onto said layer of conductive lacquer at a deposition rate of approximately 0.5 microns per minute.

3,925,572

MULTILEVEL CONDUCTOR STRUCTURE AND METHOD

Charles T. Naber, Centerville, Ohio, assignor to NCR Corporation, Dayton, Ohio

Division of Ser. No. 296,920, Oct. 12, 1972, Pat. No. 3,833,919. This application Apr. 18, 1974, Ser. No. 461,815

Int. Cl.[2] B44D *1/18*

U.S. Cl. 427—87 3 Claims

1. A method of forming a first conductor over and insulated from a second conductor on a substrate having diffused regions therein comprising the steps of:

a. depositing an undoped insulator layer on the first conductor;

b. depositing a doped insulator layer having a given flow temperature, on the undoped insulator layer to form a matrix;

c. heating the matrix to the flow temperature of the doped insulator layer to cause the exposed surface of the doped insulator layer to flow and become tapered at areas adjacent the edges of the first conductor; and

d. depositing the second conductor on the tapered surface of the doped insulator layer.

3. The method of claim 1 wherein the flow temperature is maintained below 1,200°C.

3,925,573

RECORDING METHOD

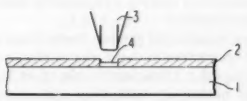
Ichirow Sugi; Haruo Takenaka; Toshiaki Okiyama, all of Tokyo, and Teruo Kobayashi, Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Division of Ser. No. 214,215, Dec. 30, 1971. This application Feb. 12, 1974, Ser. No. 441,784

Claims priority, application Japan, Dec. 30, 1970, 45-123039

Int. Cl.[2] B44F *1/10*; G03C *11/22*

U.S. Cl. 427—145 10 Claims



1. A recording method which comprises drawing on a coated film with a writing instrument having a bleaching agent, said film being transparent and having at least one layer of a dye bleachable by said bleaching agent coated thereon, said bleaching agent bleaching said dye to cause it to become transparent.

3,925,574
PROCESS FOR COATING SUBSTRATES WITH α-SUBSTITUTED β-PROPIOLACTONE GRAFT COPOLYMERS

Arthur Charles Shor, and John William Van Dyk, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Mar. 7, 1973, Ser. No. 338,688
Int. Cl. B44d *1/094, 1/09*
U.S. Cl. 427—195 **9 Claims**

1. A process for coating a substrate comprising:

1. applying to at least one surface of the substrate a layer of a polymer composition, in the form of a plastisol, organosol or powder, consisting essentially of

a. 10–95% by weight, based on the weight of the polymer composition, of a polymer, said polymer comprising a copolymer formed by contacting an amorphous base polymer of at least 2000 molecular weight having at least one random anionic site thereon selected from the group consisting of carbanion, carboxylic anion and alkoxide anion with up to 150% by weight of the polymer of at least one α-substituted-β-propiolactone, polymerizing the β-lactone to form crystallizable polymer sidechains having a length of between 3 and 1000 monomer units and a weight up to 60% by weight of the graft composition, and

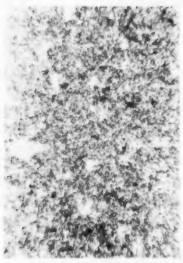
b. 5–90% by weight, based on the weight of the polymer composition, of plasticizer, solvent or a mixture thereof; and

2. heating the layer to a temperature not exceeding 200°C, in the absence of pressure, to fuse the polymer into a coherent coating.

3,925,575
CERAMIC TREATING PROCESS AND PRODUCT PRODUCED THEREBY

Peter K. Church, Cascade, and Oliver J. Knutson, Colorado Springs, both of Colo., assignors to Kaman Sciences Corporation, Colorado Springs, Colo.

Division of Ser. No. 694,303, Dec. 28, 1967, Pat. No. 3,789,096, which is a continuation-in-part of Ser. No. 642,704, June 1, 1967, abandoned. This application Feb. 15, 1973, Ser. No. 332,745The portion of the term of this patent subsequent to Jan. 29, 1991, has been disclaimed.
Int. Cl. B44d *1/14*
U.S. Cl. 427—226 **55 Claims**



1. A method of producing a chemically hardened refractory body which comprises:

forming an unsintered porous body from a mass of finely divided particles, at least the surface of said particles consisting of a refractory oxide of at least one metallic element having a vitrification temperature in excess of 600°F;

impregnating said porous body with a solution of a soluble compound of a metal selected from the group consisting of aluminum, beryllium, silicon, tin and zirconium which compound is capable of being converted to an oxide on heating to a temperature below the vitrification temperature of said particles;

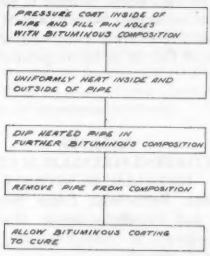
drying and curing said impregnated body by heating same to a temperature of at least 600°F. but below the vitrification temperature of the particles to convert the metal compound in situ to the oxide; and,

repeating the impregnation and heat curing steps at least once to harden and densify the body.

3,925,576
BITUMINOUS COATING SYSTEM AND ARTICLES PRODUCED THEREBY

Palmer G. Hendrix, Hickory, N.C., assignor to The Hill and Griffith Company, Cincinnati, Ohio

Division of Ser. No. 323,443, Jan. 15, 1973. This application Aug. 3, 1973, Ser. No. 385,284
Int. Cl.² B05D *7/22*
U.S. Cl. 427—230 **12 Claims**


PRESSURE COAT INSIDE OF PIPE AND FILL PIN HOLES WITH BITUMINOUS COMPOSITION
UNIFORMLY HEAT INSIDE AND OUTSIDE OF PIPE
DIP HEATED PIPE IN FURTHER BITUMINOUS COMPOSITION
REMOVE PIPE FROM COMPOSITION
ALLOW BITUMINOUS COATING TO CURE

1. A process for coating porous metal structures with a water based bituminous composition comprising the steps of:

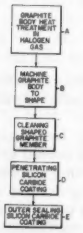
a. applying said composition onto said structure to cover the exposed surfaces thereof, at least certain of said composition being applied under a pressure in the range of about 20 to about 40 pounds per square inch against said structure to force composition into any porosities of said structure to substantially completely block same; and

b. uniformly applying heat to said structure exposed surfaces to evaporate water therefrom and thereby cure said bituminous coating, said heat being approximately at the melting point of the bituminous ingredient of said composition.

3,925,577
SILICON CARBIDE COATED GRAPHITE MEMBERS AND PROCESS FOR PRODUCING THE SAME

Elmer G. Fatzer, Brunswick, Ohio, and Edgar L. Kochka, Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 24, 1972, Ser. No. 309,591
Int. Cl.² C23C *11/08*
U.S. Cl. 427—249 **6 Claims**



1. In the process of applying a silicon carbide coating to a graphite member to produce a composite structure, the steps comprising

a. heat treating at a temperature of from about 1700°C to 2400°C an isotropic graphite body comprising fine grained isotropic graphite of a density of at least 1.75

gm/cc and having a coefficient of thermal expansion of about 7.5 to 8.3 inch per inch per degree Centigrade × 10^{-6}, the graphite grains being of a maximum particle size of less than 0.001 inch, and characterized by a relatively uniform distribution of many interconnected fine pores of an average diameter of about 5 microns and less, the pores extending to the surface of the body, the heat treating being applied for at least an hour in a halogen atmosphere, the halogen comprising at least one of the group consisting of chlorine and fluorine, the heat-treatment purifying the body to reduce the ash impurities to a range of the order of 2 to 10 ppm,

b. machining the heat treated isotropic graphite body to a member of predetermined shape and surface condition,

c. ultrasonically cleaning the machined body in a liquid cleaning fluid to remove loose surface particles,

d. depositing silicon by a gas phase reaction on the surfaces of the cleaned isotropic graphite member while at a temperature of at least 1000°C but below the melting point of silicon, to provide an infiltratable layer of silicon on the surfaces,

e. heating the silicon coated isotropic graphite member to a temperature and for a period of time to cause the silicon to melt and penetrate the pores and crevices of the graphite member and to react completely in situ with the graphite to form a layer of silicon carbide to a depth of at least about 5 mils, and

f. depositing thereover by a gas phase reaction a sealing layer of silicon carbide on the graphitic member.

3,925,578

SENSITIZED SUBSTRATES FOR CHEMICAL METALLIZATION

Joseph Polichette, South Farmingdale; Edward J. Leech, Oyster Bay, and Francis J. Nuzzi, Lynbrook, all of N.Y., assignors to Photocircuits Division of Kollmorgen Corporation, Glen Cove, N.Y.

Division of Ser. No. 167,432, July 29, 1971, Pat. No. 3,772,056. This application Aug. 13, 1973, Ser. No. 387,586The portion of the term of this patent subsequent to Mar. 27, 1990, has been disclaimed.

Int. Cl. B44d *1/14, 1/18*

U.S. Cl. 427—304 **16 Claims**

1. A process for producing metallized articles which comprises coating a substrate selected from the group consisting of

i. a chemically clean metal clad laminated substrate free of all loose particles,

ii. a non-metallic resinous laminated substrate having a polarized surface and

iii. a clean, non-metallic wettable substrate with a solution of copper, nickel, cobalt or iron salt or mixtures thereof, said salt capable of reduction to a layer of metallic copper, nickel, coablt, or iron nuclei on exposure to a chemical reducing agent until the copper, nickel, cobalt or iron salt or mixture is reduced to metallic copper, nickel, coblat or iron nuclei, and exposing said nuclei to an electroless copper, nickel, cobalt, gold, tin, rhodium or zinc bath to build up a layer of electroless nickel, cobalt, gold, silver, tin, rhodium or zinc thereon.

3,925,579

METHOD OF COATING LOW ALLOY STEELS

Charles Flinchum, Trenton; F. Curtiss Dunbar, Monroe, and Jerry L. Arnold, Franklin, all of Ohio, assignors to Armco Steel Corporation, Middletown, Ohio

Filed May 24, 1974, Ser. No. 473,142

Int. Cl.² C23C *1/00*

U.S. Cl. 427—320 **16 Claims**

14. In the method of fluxless hot dip metallic coating of low alloy steel strip and sheet stock containing at least one alloying element in uncombined form chosen from the group consisting of up to about 3% aluminum, up to about 1% titanium, up to about 2% silicon, up to about 5% chromium, and mixtures thereof, said alloying element being present in an amount greater than the critical content thereof as calculated from the following equation wherein aluminum and aluminum oxide are used as illustrative of the alloying element:

$$N_{Al}^{*} = \left[\frac{0.3 \times \pi \times D_O \times N_O^{(s)} \times V_{Fe}}{2 \times \nu\, D_{Al} \times V_{AlO\,3/2}}\right]^{1/2}$$

where

N_{Al}^{*} = original mole fraction soluble Al

D_O = diffusivity of oxygen

$N_O^{(s)}$ = oxygen mole fraction established at the surface

V_{Fe} = molar volume of body-centered-cubic iron

ν = stoichiometric ratio of oxygen to aluminum atoms in Al_2O_3

D_{Al} = diffusivity of Al

$V_{AlO\,3/2}$ = molar volume of $AlO_{3/2}$

wherein the surface of said stock is prepared for coating by a continuous preliminary treatment involving heating under conditions producing an oxide coating on said surface, followed by further heat treatment under conditions reducing to iron oxide, and wherein the stock is thereafter passed into a molten metal coating bath while surrounded by a protective atmosphere, the improvement which comprises heating said stock in the first said heating step to a temperature of about 1100° to about 1675° F in an atmosphere oxidizing to iron whereby to produce a surface layer of iron oxide containing a uniform dispersion or solid solution of oxides of said alloying elements.

3,925,580

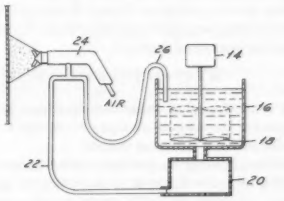
METHOD OF SPRAYING A POWDER PAINT SLURRY

George E. F. Brewer, Brighton, Mich., assignor to Grow Chemical Corporation, New York, N.Y.

Filed Apr. 25, 1973, Ser. No. 354,374

Int. Cl.² B05D *1/02*

U.S. Cl. 427—372 **6 Claims**



1. The method of spray painting an aqueous slurry of powder paint, comprising the steps of: preparing a slurry of the powder paint and water having a surface tension of the aqueous portion of less than 35 dynes/cm and having a minimum amount of water greater than the interstitial volume of the powder; spraying the powder slurry onto a substrate and evaporating from the slurry during the spraying of the slurry onto the substrate a sufficient amount of water to form a layer of powder paint and water on the substrate in which the amount of water is less than the interstitial volume of the powder.

3,925,581

PROCESS FOR FINISHING TEXTILES MADE OF FIBERS WHICH CONTAIN KERATIN

Karl Schafer, Opladen; Hans Schuster, Schildgen, and Wolfgang Klebert, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Aug. 17, 1973, Ser. No. 389,300

Claims priority, application Germany, Sept. 1, 1972, 2243068

Int. Cl.² B05D *3/02, 3/04*

U.S. Cl. 427—377 **6 Claims**

1. A process for imparting dimensional stability and felt proofing to textiles containing at least some keratinous fibers

which comprises treating said textiles with an aqueous bath which contains:

a. salts of sulphurous acid or pyrosulphites as reducing agents,

b. a polyurethane which contains free isocyanate groups prepared by a process which comprises reacting excess of an aliphatic or cycloaliphatic diisocyanate with organic polyhydroxyl compounds and which is emulsified to form an aqueous emulsion with the aid of an non-iogenic or an ion active emulsifier using a high speed stirrer, and

c. a dispersion of a polymer or copolymer based on vinyl monomers or divinyl monomers which is formed by adding the polymer or copolymer to said polyurethane dispersion,

said aqueous bath having a pH of about 5.5 to about 6.5, drying the treated textile at a temperature of 90° to 100°C and then treating it with steam at about 100°C.

3,925,582

SCALE CONTROL

Thomas E. Sample, Jr.; James W. Hughes, and Jack F. Tate, all of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 141,892, May 10, 1971, abandoned. This application Oct. 10, 1972, Ser. No. 296,399

Int. Cl.² B05D *3/02*; **B32B** *27/40*

U.S. Cl. 427—385 **13 Claims**

1. A process for imparting scale-resistant properties to substrate surfaces normally susceptible to mineral scale formation while in contact with mineralized water containing less than about 5 percent hydrocarbons and wherein any heat flow is from the substrate surface into the mineralized water comprising the steps of:

a. applying to said surfaces normally susceptible to scale formation a scale-resistant amount of partially heat cured polyurethane resins sufficient to coat said surfaces, said resin being an adduct of polyol having an average hydroxyl functionality of three or greater and containing pendant polyoxyalkylene chains obtained by including in the polyurethane reactive mixture monohydric polyethers having the structural formula

$$R-O-(CH_2-CHR'-O\rightarrow_n H$$

wherein R = alkyl, aryl or other radical which is non-reactive with isocyanate functional groups, R' = alkyl, and n is an integer from about 3 to about 50 and

b. further heat curing the partially cured polyurethane resin to a degree such that said resin possesses good adhesion to said substrate, stability to in-service environmental conditions, but without significantly altering the integrity of the pendant polyoxyalkylene chains in the further cured polyurethane resin.

3,925,583

COMPOSITE QUARTZ GLASS BODY

Karlheinz Rau, and Karl Seiler, both of Hanau am Main, Germany, assignors to Heraeus-Schott Quarzschmelze GmbH, Hanau am Main, Germany

Filed Feb. 6, 1973, Ser. No. 330,136

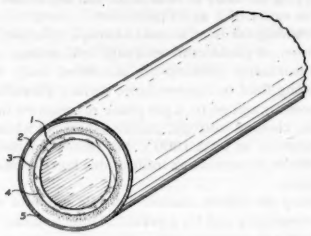
Claims priority, application Germany, Feb. 11, 1972, 2206493

Int. Cl.² C03B *19/06*; **C03C** *17/02*

U.S. Cl. 428—36 **13 Claims**

1. Composite quartz glass body comprising an inner layer of synthetic quartz glass and an outer layer of quartz glass fused onto said inner layer by melting of quartz crystal granules, said outer layer having a portion thereof which covers said inner layer and containing at least one inhibitor selected from the group of hydroxyl ions and divalent cations, said inhibitor retarding the diffusion of substances through said quartz glass body which interfere with the process of manufacturing solid state components, said portion of said outer layer being at least 10 percent to at most 90 percent of the thickness of said fused-on outer layer, said portion of the outer layer being contiguous with the inner layer, the remaining portion of said outer layer being free of said inhibitor and being more distant from said inner layer than the portion containing said inhibitor.

8. Composite quartz glass body comprising an inner layer of synthetic quartz glass and an outer layer of quartz glass fused onto said inner layer by melting of quartz crystal granules, said outer layer having a portion thereof which covers said inner layer and containing small air bubbles as an inhibitor which retards the diffusion of substances through said quartz glass



body which interfere with the process of manufacturing solid state components, said portion of said outer layer being at least 10 percent to at most 90 percent of the thickness of said fused-on outer layer, said portion of the outer layer being contiguous with the inner layer, the remaining portion of said outer layer being free of said inhibitor and being more distant from said inner layer than the portion containing said inhibitor.

3,925,584

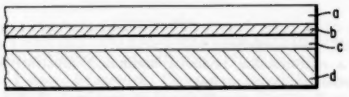
ADHESIVE SEAL AND TAPE FOR SEALING

Nagayuki Suzuki; Tsutomu Nakamura, and Katsuto Yamada, all of Tokyo, Japan, assignors to Daiichi Seiyaku Company Limited and Sugawara Kogyo Co., Ltd., both of Tokyo, Japan

Continuation-in-part of Ser. No. 283,416, Aug. 24, 1972, abandoned. This application Feb. 7, 1974, Ser. No. 440,484

Int. Cl.² C09J *7/02*; **G09F** *3/03*

U.S. Cl. 428—40 **9 Claims**



1. An adheisve tape or article for sealing packages, containers and the like which comprises a weak thin-leaf material having a breaking strength of less than 2 kg/25 mm width laminated to a support sheet through an interlying weak adhesive layer consisting essentially of paraffin wax, microcrystalline wax or mixtures thereof having an adheisve strength in the range of 50 g to 400 g per 25 mm width and having the exposed surface of said thin-leaf material coated with a strong pressure-sensitive or heat-sensitive adhesive which has an adhesive strength greater than 500 g per 25 mm width.

3,925,585

STICKER

Katumi Aoyagi, Chofu, Japan, assignor to Shiro Kojima, Japan, a part interest

Filed Apr. 27, 1973, Ser. No. 355,211

Claims priority, application Japan, Apr. 27, 1972, 47-42528

Int. Cl. B32b *3/16*

U.S. Cl. 428—42 **10 Claims**

1. A sticker comprising a sheet, a layer of pressure sensitive adhesive supported on said sheet, a detachable release paper

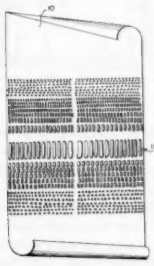
temporarily attached to said layer, said sheet being provided with a parting line which divides said sheet into a sheet clipping and an annular piece of the sheet, to be individually detached from the release paper, and an imprint on said sheet which correlates said clipping with said piece when detached.

3,925,586

STENCIL CASTING PROCESS AND RESULTING ARCHITECTURAL ART PRODUCT

Paul E. Maxwell, Carrollton, Tex., assignor to Multiple Originals, Inc., Dallas, Tex.

Filed Feb. 19, 1974, Ser. No. 443,313
Int. Cl.² B32B *3/16*
U.S. Cl. 428—195 **9 Claims**



1. An architectural art product, comprising:

a. a building size structure section forming a substrate material for attachment to a structural member,

b. a bas-relief build-up of a non-metallic, nonhardening medium onto said material to be incorporated thereinto for permanent integration into said material for installation into the architectural construction with which it is used, and wherein,

c. said medium represents a non-brittle attractive pattern that is distinctive from conventional architectural appearances, and wherein,

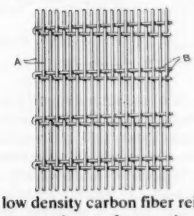
d. said substrate material has a high degree of flexibility.

3,925,587

PERVIOUS LOW DENSITY CARBON FIBER REINFORCED COMPOSITE ARTICLES

Im Keun Park, Summit, N.J., assignor to Celanese Corporation, New York, N.Y.

Division of Ser. No. 347,594, April 3, 1973, Pat. No. 3,859,158, which is a division of Ser. No. 135,698, April 20, 1971, Pat. No. 3,779,789. This application July 31, 1974, Ser. No. 493,633
Int. Cl.² C09J *5/02*
U.S. Cl. 428—255 **10 Claims**



1. A pervious low density carbon fiber reinforced composite article having a pore volume of approximately 10 to 75 percent by volume of the total composite article, and a bulk density of about 0.4 to 1.4 grams/c.c. comprising:

a. at least one layer of carbon tape of an open weave construction comprising a plurality of adjacent substantially parallel and laterally spaced linear warp ends of a carbonaceous fibrous material containing at least 90 percent carbon by weight substantially coextensive with the length of said tape wherein no substantial lateral contact is made between said adjacent warp ends, and a fibrous weft pick containing at least 90 percent carbon by weight interlaced with said warp ends in a plain weave construction at a frequency of about 2 to 8 picks per inch of said tape with said weft pick being provided under a tension sufficient that said linear configuration of said warp ends is substantially unimpaired, and

b. a substantially cured thermosetting resinous material in intimate association with said carbon tape in a concentration of about 20 to 50 percent by weight based upon the total weight of said composite article wherein lateral interstices are substantially maintained between said adjacent warp ends within a given layer of said tape of said composite article.

3,925,588

PRODUCTION OF POLYESTER YARN

Robert Moore Marshall, Chester, and Kimon Constantine Dardoufas, Richmond, both of Va., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Apr. 1, 1974, Ser. No. 456,502
Int. Cl.² D02G *3/36*; **D02M** *13/20*
U.S. Cl. 428—395 **4 Claims**

1. Polyester yarn having incorporated thereon a finish composition consisting essentially of a polyalkylene glycol condensation product having the formula:

$$R-\overset{O}{\overset{\|}{C}}-O(C_2H_4O,\ C_3H_6O)_{x+y}H$$

where R is an alkyl group having 6 to 18 carbon atoms, x and y are the number of moles of propylene oxide and ethylene oxide respectively and wherein ethylene oxide comprises 40 to 60% of the combined total of ethylene oxide and propylene oxide and $x+y$ has a value to produce a molecular weight of from 300 to 600. said polyalkylene glycol condensate being incorporated on the yarn at an application level of 0.50% to 1.5% based on the weight of the yarn.

3,925,589

ESTERS OF POLYOXYALKYLENE GLYCOLS AND MIXED DIBASIC ACIDS AS FIBER FINISHES

Robert J. Sturwold, and Fred O. Barrett, both of Cincinnati, Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohio

Division of Ser. No. 260,516, June 7, 1972, Pat. No. 3,850,682, and a continuation-in-part of Ser. No. 223,752, Feb. 4, 1972, Pat. No. 3,769,215. This application Aug. 16, 1974, Ser. No. 497,917
Int. Cl.² C08G *69/46*; **C08J** *7/04*
U.S. Cl. 428—395 **5 Claims**

1. A lubricated fiber comprising a polyamide having deposited thereon about 0.1 to 10% by weight of an ester obtained by the reaction of 1.5 to 2.1 mols polyoxyethylene glycol having a molecular weight from about 300 to about 4000 and recurring alkylene units containing from 2 to 4 carbon atoms with 1 mol of a mixture of dibasic acids consisting of 5 to 95 mol percent dimer hydrocarbon acids containing 32 to 54 carbon atoms and 95 to 5 mol percent short-chain dibasic

hydrocarbon acids containing 2 to 12 carbon atoms, said ester having 70% or more of the carboxyl groups reacted.

3,925,590

LAMINATE WITH AN ADHESIVE INCLUDING AN N-NITROSO COMPOUND

Walter R. Hausch; John W. Fieldhouse, and Edward L. Kay, all of Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 383,761, July 30, 1973, abandoned. This application Aug. 23, 1974, Ser. No. 500,199

Int. Cl.² B32B *27/40*

U.S. Cl. 428—423 **1 Claim**

1. An adhesively-bonded laminate wherein olefinic rubber is bonded to polyurethane rubber by an adhesive composition comprising an organic film-forming material, an organic isocyanate and as an adhesion promoter a compound selected from the group consisting of N-nitrosodiphenylamine, N,N′-dinitrosopiperazine and N,N′-dihexyl-N,N′-dinitroso-m-phenylenediamine.

3,925,591

TRANSPARENT LAMINATE FILMS OF POLYOLEFINES AND POLYESTERS AND PROCESSES FOR THEIR MANUFACTURE

Franz Breitenfellner, and Wolfgang Eberle, both of Bensheim, Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 29, 1975, Ser. No. 544,985

Claims priority, application Switzerland, Feb. 5, 1974, 1554/74

Int. Cl.² B32B *27/08, 27/32, 27/36*

U.S. Cl. 428—483 **10 Claims**

1. Deep-drawable, transparent laminate films of polyethylene films, polyester films and an adhesion promoter, characterised in that at least one unstretched polyester film consisting of or based on polyethylene terephthalate, having a crystallisation temperature of at least 150°C, measured in the film, is bonded via an adhesion-promoting layer of ethylene/vinyl acetate copolymer to at least one unstretched polyethylene film.

3,925,592

HOLDER FOR ELECTRICAL EQUIPMENT

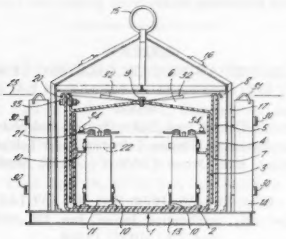
Alan David Webb, Hinchley Wood, England, assignor to The British Petroleum Company Limited, London, England

Filed Mar. 12, 1974, Ser. No. 450,319

Claims priority, application United Kingdom, Mar. 15, 1973, 12405/73

Int. Cl.[2] H05K 5/00

U.S. Cl. 174—17 LF 8 Claims



1. A holder suitable for protection of electrical equipment in an underwater location comprising: a container having an inner wall and an outer wall defining a space therebetween, said outer wall and said inner wall extending upwardly from a bottom means, a removable cover having a downwardly extending skirt intermediate the outer wall and inner wall and which extends downwardly into the space defined by the inner wall and outer wall such that, when the container is filled with an electrically non-conducting water-immiscible liquid and the holder submerged underwater, then ingress of water into the container and egress of liquid from the container are prevented, said outer wall being higher than said inner wall and said cover having an upwardly and outwardly extending projection fitting over the outer wall of the container, and access means for an electrical connection between the interior of the container and the exterior.

3,925,593

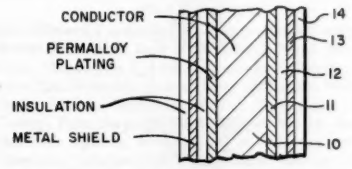
MONOTONICALLY CHANGING SKEW IN A MAGNETOSTRICTIVE ANISOTROPIC THIN FILM PLATED WIRE LINE SENSOR

Vahram S. Kardashian, Plymouth Village, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 11, 1974, Ser. No. 522,398The portion of the term of this patent subsequent to Feb. 18, 1992, has been disclaimed.

Int. Cl.[2] H01B 7/18

U.S. Cl. 174—36 2 Claims



1. An improved plated wire for use in an intrusion detection system which uses as a transducer an extended length of strain responsive anisotropic thin film plated wire, the source end of the wire being energized by the output of a high frequency oscillator and in which system because of losses in the plated wire it is desired that the voltage vs. strain response of the wire at the remote end produces a larger electrical signal at that point than the same strain at the source end, the improved plated wire comprising:

an extended length of wire substrate; and

a strain responsive anisotropic magnetostrictive thin film deposit on said substrate, said deposit being monotonically varied along the length of said wire in that the magnetization skew angle is progressively increased thereby providing a controlled skew variation along the length of said wire so that the voltage vs. strain response along the length of said wire increases progressively from a relatively low level response at the source end of the wire to a relatively large response at the remote end of the wire.

3,925,594

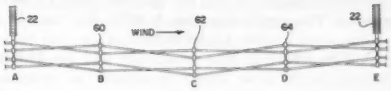
SUPPRESSION OF WAKE-INDUCED OSCILLATIONS IN A CONDUCTOR BUNDLE

Charles B. Rawlins, Massena, N.Y., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 16, 1974, Ser. No. 532,742

Int. Cl.[2] H02G 7/14, 7/12

U.S. Cl. 174—42 7 Claims



1. An arrangement spacing at least three overhead conductors in an aerodynamically stable, torque-free manner, with two of said conductors being disposed in generally the same horizontal plane, the arrangement comprising at least two devices spacing the conductors at spaced apart locations lengthwise thereof, with each spacing device having a clamping means respectively attaching the spacing devices to the conductors at said spaced apart locations, the clamping means of each spacing device attaching the same to the two horizontal conductors being vertically displaced from each other, the clamping means of the two spacing devices attached to the same horizontal conductor being vertically displaced from each other, such that the horizontal conductors respectively meander in an opposed, vertical manner from spacer to spacer.

7. A method of suppressing aerodynamic instability in a bundle of three or more overhead conductors in a torque free manner, with two of said conductors being located in generally the same horizontal plane, the method comprising the steps of vertically displacing the two horizontal conductors in an opposed, undulating manner and maintaining the horizontal conductors in such an opposed undulating manner by inserting at least two spacing devices in the cross section of the bundle at spaced locations lengthwise of the bundle, and clamping the two spacing devices to the conductors at said spaced locations using clamps on the two horizontal conductors at one location lengthwise of the bundle that are vertically displaced from each other, and, using clamps at the two spaced locations of each of the two horizontal conductors that are vertically displaced from each other.

3,925,595

FRAMELESS DAMPING SPACER

Ronald G. Hawkins, Massena, N.Y., assignor to Aluminum Company of America, Pittsburgh, Pa.

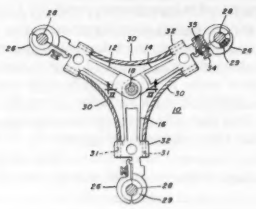
Filed Feb. 24, 1975, Ser. No. 552,222

Int. Cl.[2] H02G 7/14, 7/12

U.S. Cl. 174—42 18 Claims

1. A damping spacer for parallel, overhead conductors, the damping spacer comprising at least two rigid, spacer arms each having a conductor clamp at one end and rigid pin means

pivotally connecting the other ends of the arms together about the axis of the rigid pin means, and, a stranded wire cable



extending between said arms resiliently connecting the arms together.

3,925,596

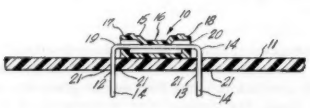
HEAT RECOVERABLE CONNECTORS

Dennis C. Siden, Sunnyvale, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 261,788, June 12, 1972, abandoned. This application Mar. 1, 1973, Ser. No. 337,138

Int. Cl. H05k *1/18*

U.S. Cl. 174—68.5 **20 Claims**



1. A termination device useful for making a connection between at least two conductors, said device comprising:

a hollow, heat-recoverable member having at least two unrecovered open ends; and

a conductor held within said member having a portion thereof extending outside of at least two of said unrecovered open ends.

3,925,597

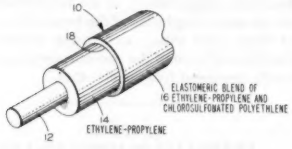
ELECTRICAL CONDUCTORS WITH STRIPPABLE INSULATION AND METHOD OF MAKING THE SAME

Thaddeus Dominick Misiura, Sandy Hook; Joseph Edward Vostovich, Bridgeport, and Ralph Edward Wahl, Trumbull, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed May 9, 1974, Ser. No. 468,397

Int. Cl.² H01B *7/02*

U.S. Cl. 174—102 SC **7 Claims**



1. An insulated metallic electrical conductor having a covering thereon comprising polymeric materials including a composite of an electrically insulating body of a copolymer of ethylene and propylene having an ethylene content of not more than about 50 percent by weight with a surface adheringly joined to a contacting surface of an easily and cleanly strippable overlying semiconductive body comprising an elastomeric blend of about 20 to about 40 parts by weight of a copolymer of ethylene and propylene admixed with about 60 to about 80 parts by weight of chlorosulfonated polyethylene, said contacting surfaces of the insulating body and overlying semiconducting body being adheringly joined to each other substantially continuously over their common interface so as to require a pulling force for their separation of at least about 2 pounds and not more than about 18 pounds per ½ inch width of the joined composite by applying the body of semiconducting elastomeric blend while in an uncured condition to the insulating body in a cured condition and thereafter curing said body of semiconducting elastomeric blend while a surface thereof is in adjoining physical contact with a surface of the cured insulating body.

3,925,598

ARMORED SUBMARINE CABLE HAVING LENGTHWISE DISTRIBUTED INSULATION MEANS IN EACH ARMOR WIRE

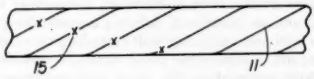
Kinya Suzuki, Tokyo, and Tokio Izumi, Yokohama, both of Japan, assignors to Nippon Telegraph and Telephone Public Corporation and Ocean Cable Co., Ltd., both of Tokyo, Japan

Filed Dec. 30, 1974, Ser. No. 537,140

Claims priority, application Japan, Jan. 10, 1974, 49-6260

Int. Cl.² H02G *15/08*

U.S. Cl. 174—108 **13 Claims**



1. In an armored submarine cable including a cable core centrally of said cable and a plurality of armor wires extending substantially longitudinally of said cable around said core and spaced apart therefrom,

the improvement wherein each of said armor wires comprises a plurality of lengthwise successively aligned sections of anticorrosive metal wires and an electric insulation means between each adjacent two of said sections of said anticorrosive metal wires.

3,925,599

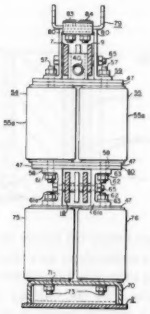
POWER-CONDUCTOR ASSEMBLY AND INSULATING SUPPORTING MEANS THEREFOR

Charles M. Cleaveland, Irwin, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 308,370, Nov. 21, 1972, abandoned. This application Jan. 16, 1974, Ser. No. 433,964

Int. Cl.² H01B *17/16*

U.S. Cl. 174—150 **9 Claims**



1. In combination, two aligned pairs of post-type supporting insulators having a pair of laterally spaced channel members

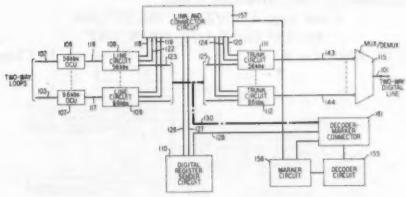
(61) disposed therebetween, said channel members each having a web portion and spaced edge flanges attached thereto, each of said pairs comprising two laterally spaced post-type separate insulators in generally parallel relationship with respect to each other, the first and second insulators of one pair being axially aligned with the first and second insulators of the other pair, each channel member having its edge flanges fixedly secured to the confronting end faces of the respective first or second insulators of the two aligned pairs of insulators, and a single-phase longitudinally extending power-conductor assembly fixedly fastened between the spaced webbed portions of the two laterally-spaced channel members (61) for fixed supporting securement.

3,925,600

LINE SWITCHING SYSTEM FOR DIGITAL DATA

Robert Edward Cardwell, Fair Haven; Robert Leon Davis, Holmdel; Patrick John Marino, Middletown, and Edward Joseph McNamara, Manalapan Township, Monmouth County, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 20, 1975, Ser. No. 542,582
Int. Cl.[2] H04L *11/00*
U.S. Cl. 178—3 **14 Claims**



7. In a data signaling system, a plurality of switching offices interconnected by two-way trunk lines conveying digital data signals, each switching office including line circuits terminating two-way station lines conveying digital data signals, trunk circuits terminating the two-way trunk lines and switch means for selectively interconnecting station circuits and available ones of the trunk circuits to interchange the digital data signals on the station and trunk lines, each of the trunk circuits being rendered unavailable when selectively interconnected, and each of the trunk circuits including means responsive to concurrence of predetermined incoming digital data signals on the trunk line and predetermined outgoing digital data signals on the selective interconnection for releasing the trunk circuit from the selective interconnection.

3,925,601

DIGITAL REGISTER SENDER AND LINE CIRCUIT FOR DATA SWITCH

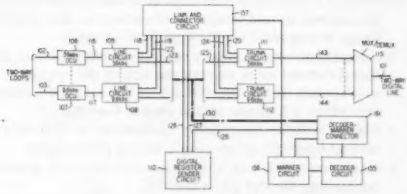
Robert Edward Cardwell, Fair Haven; David Emory Carlson; Robert Leon Davis, both of Holmdel; Edward Joseph McNamara, Manalapan Township, Monmouth County; Randolph John Pilc, Holmdel; Gabriel Gary Schlanger, West Orange; David Morris Tutelman, Ocean Township, Monmouth County; Peter Stephen Warwick, Middletown, and Herbert Mortimer Zydney, Rumson, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 20, 1975, Ser. No. 542,583
Int. Cl.[2] H04L *11/00*
U.S. Cl. 178—3 **24 Claims**

1. A line switching office for interconnecting data transmission channels including a plurality of intraoffice channels, an interface circuit including means for applying data signals received from each of the transmission channels to an associated one of the intraoffice channels, and switch means for interconnecting intraoffice channels;

CHARACTERIZED BY

a common control circuit connectable to the intraoffice channels and including means for sending control data signals to the interface circuits by way of the intraoffice channels; and



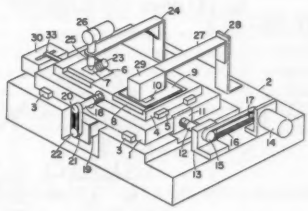
means in each interface circuit responsive to the control data signals for precluding the application of received data signals to the associated intraoffice channel.

3,925,602

APPARATUS FOR ENGRAVING A PORTRAIT ON CERTIFICATION CARD

Yasushi Doi, Kyoto; Mikio Shoda, Nagaokakyo; Masatoshi Oguri, and Joji Hashimoto, both of Kyoto, all of Japan, assignors to Dainippon Screen Seizo Kabushiki-Kaisha, Kyoto, Japan

Filed Oct. 19, 1973, Ser. No. 408,162
Claims priority, application Japan, Oct. 31, 1972, 47-108501
Int. Cl. G03f *7/00*; **H04n** *1/22*
U.S. Cl. 178—6.6 B **1 Claim**



1. An apparatus for reproducing an engraved image for exhibiting a portrait on a certification card comprising,

a frame having a top portion,

a first base horizontally movably mounted on said top portion of said first base,

first drive means for laterally reciprocating said first base relative to said frame,

a second base horizontally movably mounted on said first base, said second base having a top portion,

second drive means for moving said second base a predetermined distance in a transverse relationship with respect to the direction of movement of said first base, said predetermined distance comprising one scanning pitch,

an original picture base plate mounted on the top portion of said second base,

a certification card base plate mounted on the top portion of said second base,

a photoelectric scanning means on said frame and being disposed in horizontal stationary opposition to an original picture on said original picture base plate,

an engraving scanning means on said frame and being disposed in horizontal stationary opposition to a certification card on said certification base plate, said engraving scanning means including a graver,

said photoelectric scanning means scanning said original picture in linear succession to obtain an image signal current,

means connecting said engraving scanning means and said photoelectric scanning means so that said image signal current is fed to said engraving scanning means,

means for vibrating said engraving scanning means in a vertical relationship with respect to said certification card in response to said image signal current so that a halftone image is engraved on the certification card,

the amplitude of said graver being controlled by said image signal current so as to vary the size of the engraved dots in response to the appearance of the original picture to reproduce a halftone image similar thereto,

a linear encloder operatively connected to said first and second bases for producing a timing pulse signal,

means connecting said linear encoder with said graver for controlling the dot pitch thereof,

said second drive means comprising a pulse motor which is rotated intermittently upon reciprocation of said first base thereby causing said second base to move through one scanning pitch upon each reciprocation,

said second drive means also comprising a feed screw threadably secured to said second base, an elastic transmission member connecting said pulse motor and said feed screw for extinguishing non-uniformity of pitch of the scanning dots in the reproduced image.

3,925,603

APPARATUS FOR RECORDING AND/OR REPRODUCING INFORMATION SIGNALS HAVING AUTOMATIC FOCUSING

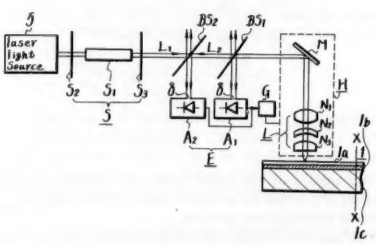
Yosuke Naruse; Taisuke Yoshioka; Masami Himuro, and Keiichi Ito, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed June 3, 1974, Ser. No. 476,153

Claims priority, application Japan, June 11, 1973, 48-65663

Int. Cl.[2] H04N *5/76;* **G11B** *7/12*

U.S. Cl. 178—6.6 R **2 Claims**



1. Automatic focusing apparatus for use in apparatus for recording and/or reproducing information signals having a record medium with a mirror surface; a source of light and a lens assembly optically positioned in the light path extending between the light source and the record medium to focus a beam of light emitted from said light source onto said mirror surface whereby the focused beam is used to record information on the record medium and/or reproduce information from the record medium, comprising: a first beam splitter optically positioned in said light path for transmitting light from said light source toward said lens assembly, for transmitting a portion of light reflected from said mirror surface and received from said lens assembly, and for reflecting a portion of said light reflected from said mirror surface; a second beam splitter optically positioned in said light path and spaced from said first beam splitter for transmitting said light from said light source toward said lens assembly for receiving said portion of light transmitted by said first beam splitter, and for reflecting a portion of said light received from said first beam splitter; first photosensing means optically coupled to said first beam splitter for receiving said portion of light reflected by said first beam splitter to produce a first signal proportional to the intensity of light received thereby; second photosensing means optically coupled to said second beam splitter for receiving said portion of light reflected by said second beam splitter to produce a second signal proportional to the intensity of light received thereby; first and second slit means positioned in light intercepting relation with respect to said first and second photosensing means, respectively, each of said slit means having an aperture in the range of 6 to 100 microns through which light is transmitted to said photosensing means; and lens control means mechanically coupled to at least one element of said lens assembly and responsive to the difference between said first and second signals for moving said at least one element to thereby maintain the point of focus of said beam of light on said mirror surface notwithstanding fluctuations in the spacing between said lens assembly and said mirror surface.

3,925,604

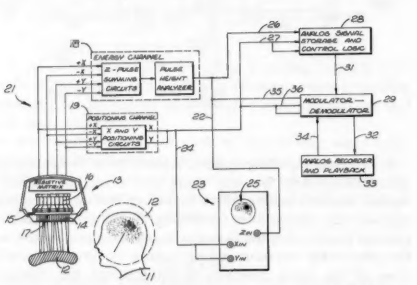
ANALOG-RECORDING APPARATUS FOR RECORDING AND DERANDOMIZING RANDOMLY-OCCURRING DATA

Richard D. Bliss, Riverside, Calif., assignor to Riverside Bio-Engineering, Inc., Riverside, Calif.

Filed Aug. 4, 1972, Ser. No. 277,966

Int. Cl.[2] G01T *1/20;* **H04N** *1/04*

U.S. Cl. 178—6.6 R **13 Claims**



1. Analog-recording apparatus for recording analog signals on serial-recording medium in a derandomized fashion which signals are representative of randomly-occurring data emanating from a detector, said apparatus comprising:

A. a plurality of storage cells each adapted to receive and store for later complete removal one of a plurality of analog signals representative of randomly-occurring data;

B. timing means for generating first and second time intervals;

C. gating means operative during said first time interval for applying one of said analog signals upon generation thereof to one of said cells only in the absence of a signal being stored therein; and

D. means operative during said second time interval for sequentially removing said stored signals from said cells with a regularized time interval therebetween for recording on said recording medium.

3,925,605

DROPOUT DETECTOR FOR VIDEO DISC PLAYBACK

John L. Rennick, Elmwood Park, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed June 28, 1974, Ser. No. 484,041

Int. Cl.[2] H04N *5/76*

U.S. Cl. 178—6.6 R **3 Claims**

1. In a video player for developing a television image from a recorded carrier wave signal which is angle-velocity-

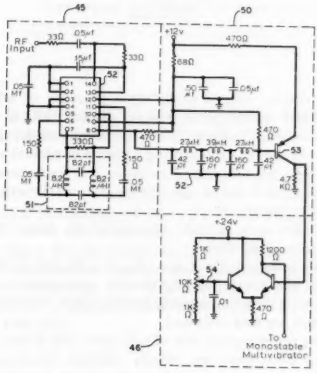
modulated over a predetermined range of frequencies in accordance with desired information, said carrier wave signal being subject to frequency excursions outside of said frequency range which excursions represent abnormalities and undesired information, a dropout compensator comprising:

angle-velocity-modulation detector means having an amplitude-versus-frequency response characteristic which has a knee extending over a band of frequencies of a width corresponding to that of said predetermined frequency range;

means for impressing said carrier wave signal on said angle-velocity-modulation detector means with the predetermined frequency range of the carrier wave signal substantially centered on said knee of said amplitude-versus-frequency response characteristic;

amplitude-clipping means coupled to said angle-velocity-modulation detector means for responding to said carrier wave signal to develop a control signal only during operating intervals in which said carrier wave signal experiences said frequency excursions;

and means for utilizing said control signal for substantially eliminating visible dropouts from said television image.



3. In a video player for developing a television image from a recorded carrier wave signal which is frequency modulated with brightness information over a predetermined frequency range, a dropout compensation system for substantially eliminating dropouts from said reproduced image, which system comprises:

means, including a delay line and at least one frequency discriminator having a linear amplitude-versus-frequency response characteristic throughout said predetermined frequency range, for developing a principal program signal and a delayed program signal;

dropout detector means comprising an additional frequency discriminator having an amplitude-versus-frequency response characteristic with a knee substantially centered with respect to said predetermined frequency range and having substantially linear portions extending in the same polarity from opposite sides of said knee;

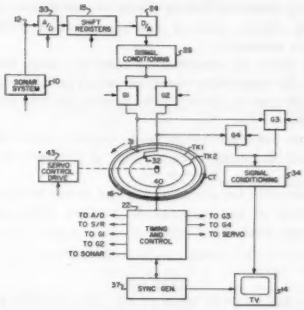
amplitude-selective means coupled to said dropout detector means for developing a control signal in response to any frequency excursion beyond said predetermined frequency range;

and means responsive to said control signal for substituting said delayed program signal for said primary program signal during intervals of said excursions to substantially eliminate dropouts in said reproduced image.

3,925,606
SCAN CONVERSION APPARATUS

Kenneth E. Wood, Annapolis; William F. Parrish, Baltimore, both of Md., and Paul G. Kennedy, Monroeville, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 10, 1974, Ser. No. 478,127
Int. Cl.² H04N *7/18*
U.S. Cl. 178—6.8 **8 Claims**



1. Scan conversion apparatus comprising:

A. display means for displaying multiple lines of information on a display area;

B. means for providing multiple sequential input signals indicative of a condition to be displayed on said display means as display signals;

C. first storage means;

D. means for periodically sampling a said input signal and placing each sampled value into said first storage means at a first rate;

E. second storage means;

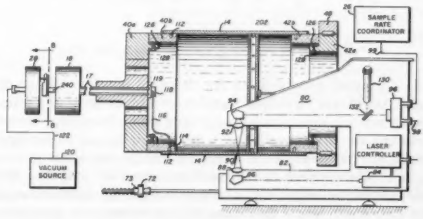
F. means for reading out said stored sampled values periodically during the period between successive input signals and placing said read out values into said second storage means at a second rate, as portions of a display signal; and

G. means for reading out all of said stored portions of a display signal to provide a total display signal to be displayed as a line on said display means.

3,925,607
ROTARY DATA BASE CONVERTER WITH FLEXIBLE DATA BASE

Charles Elwood Hauber, San Jose, Calif., assignor to The Singer Company, New York, N.Y.

Filed Aug. 21, 1974, Ser. No. 499,200
Int. Cl.² H04N *1/08*
U.S. Cl. 178—7.1 **10 Claims**



1. A rotating digitizer system for converting existing data on a flexible transparent medium into a new data base, comprising:

a support assembly having spaced end drums connected by a rigid member and adapted to peripherally retain the

transparent medium in a cylindrical configuration across a scanning window formed by the space between the end drums and the rigid member and occupying at least a major arcuate portion of the cylindrically retained transparent substrate;

an internal radial force means adapted to prevent deviation of the transparent medium inwardly from the cylindrical configuration for minimizing saddle effect and edge effect deviations;

a scanning assembly having a light source means and a light sensing means, one of which is positioned within the support assembly;

a rotary drive for establishing relative rotary motion between the assemblies about an axis of rotation concentric with the axis of the cylinder formed by the transparent medium;

a traverse drive for establishing relative traverse motion between the assemblies parallel to the axis of rotation; and

drive controller for coordinating the drives to scan at least a portion of the transparent medium displayed in the scanning window.

3,925,608

ARRANGEMENT FOR SIGNAL DELAY, PARTICULARLY FOR USE IN A VERTICAL APERTURE CORRECTOR FOR TELEVISION

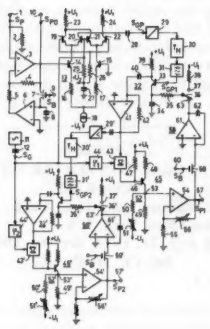
Prudent Eduardus Jacobus Mollet, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 27, 1973, Ser. No. 373,945

Claims priority, application Netherlands, July 8, 1972, 7209540

Int. Cl.[2] H04N *3/16*

U.S. Cl. 178—7.1 **10 Claims**



1. A circuit arrangement for delaying a television image signal to provide an output signal with a black level at a reference potential, said circuit comprising a high frequency circuit including an carrier oscillator, a modulator having a first input means for receiving said television image signal, a second input means coupled to said oscillator, and an output, a first delay circuit having an input coupled to said modulator output and an output, and a first demodulator having an input coupled to said first delay circuit output, and an output means for providing said output signal; and first control circuit means coupled to said demodulator output and said high frequency circuit, said first control circuit including both a clamping circuit means for setting the black level of said output signal to a reference potential and a means for comparing said black level with said reference level and for generating and applying a control voltage to said high frequency circuit.

3,925,609

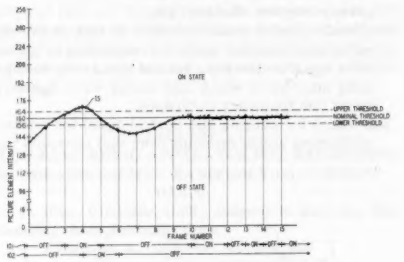
ANIMATED DISPLAY SYSTEMS WITH DITHER THRESHOLD HYSTERESIS BAND

William Herbert Ninke, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 21, 1975, Ser. No. 542,861

Int. Cl.[2] H04N *3/14*

U.S. Cl. 178—7.3 D **22 Claims**



1. In a display system including a plurality of selectively energized and de-energized bi-level display cells to each of which are assigned respective first and second dither threshold values, a method for representing a matrix of picture elements each having a predetermined intensity and each corresponding to a respective one of said display cells, said method comprising the steps of,

selecting for each of said cells one of the dither threshold values assigned thereto,

accessing a de-energized one of said cells only if the intensity of the corresponding picture element bears a first predetermined relationship to the dither threshold value selected for that cell, and

accessing an energized one of said cells only if the intensity of the corresponding picture element bears a second predetermined relationship to the dither threshold value selected for that cell,

said method characterized in that said selecting for each of said cells is made on the basis of the state of said each cell.

3,925,610

GRAPHIC COMMUNICATIONS TABLET

Joseph Charles French, North Plainfield, N.J.; Anant Kumar Nigam, Fairfield, Conn., and Gerhard Martin Sessler, Summit, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 12, 1974, Ser. No. 496,530

Int. Cl.[2] G08C *21/00;* **G11B** *9/02;* **H04R** *19/00*

U.S. Cl. 178—18 **10 Claims**

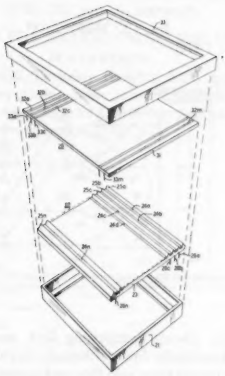
1. Graphic communications apparatus comprising:

an electret film selectively metallized on one surface thereof, said electret film locally deformable in response to the pressure of a writing stylus;

a rigid backplate selectively metallized on one surface thereof, said backplate mounted in spaced juxtaposition with said electret film so that said metallized areas of said backplate are in spaced juxtaposition with said metallized areas of said electret film;

a plurality of ridge means dimensioned for decreasing the rise time of said electret film to improve performance at low writing speeds by reducing the amplitude of the reverse polarity overshoot signal, each of said ridge means

interposed between the metallized regions of said backplate; and

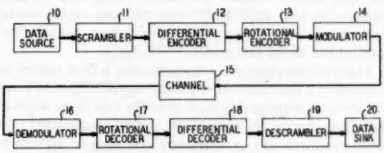


means for connecting the metallized areas of said electret film and said backplate to a plurality of output terminals.

3,925,611
COMBINED SCRAMBLER-ENCODER FOR MULTILEVEL DIGITAL DATA

Thomas Mann Dennis, Oakhurst, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 12, 1974, Ser. No. 496,529
Int. Cl.² H04L *3/00, 9/00*
U.S. Cl. 178—22 **10 Claims**



1. In combination with a synchronous digital data transmission system in which multilevel symbols plottable as points on a two-dimensional four-quadrant signal space diagram are encoded on parallel bit streams, a transmitting terminal comprising:

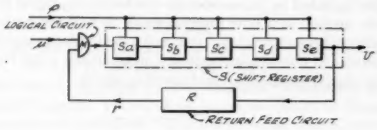
means for differentially encoding at least the parallel streams representing the most significant bits of said multilevel symbols by continuously augmenting the last-transmittted bits by the increment between such last-transmitted bits and incoming bits therein, and

means for rotationally encoding other parallel streams representing bits of lesser significance in said multilevel symbols from a uniform rotational Gray coding format throughout all quadrants of said signal space diagram to a bilaterally symmetric relationship.

3,925,612
DIGITAL SCRAMBLING APPARATUS FOR USE IN PULSED SIGNAL TRANSMISSION

Gustav Guanella, Zurich, and Rudolf Schweizer, Wettingen, both of Switzerland, assignors to Patelhold Patentverwertungs- und Elektro-Holding AG, Glarus, Switzerland

Filed Jan. 24, 1964, Ser. No. 339,953
Claims priority, application Switzerland, Jan. 30, 1963, 1165/63
Int. Cl.² H04L *9/00;* **H04K** *1/02*
U.S. Cl. 178—22 **17 Claims**

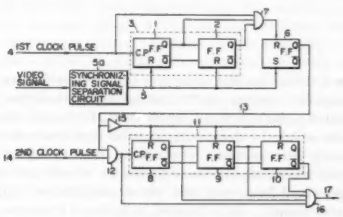


1. In combination, a secrecy signaling system for transmitting a polarity modulated message pulse series from a transmitting station to a receiving station including scrambling pulse generating means at both said stations, to produce a pair of identical scrambling pulse series, for scrambling and unscrambling, respectively, said message pulse series, scrambling pulse converting means at each of said stations to convert a scrambling control pulse series of arbitrarily varying polarity into a final scrambling pulse series, said converting means comprising a pulse shift register having a plurality of cascade-connected pulse storage stages and an input fed by said control pulse series, at least one feedback circuit connecting the output of a first one of said stages to the input of a second preceding stage of said register, and at least one logical circuit interposed in the path of said feedback circuit, to produce final scrambled pulses at the output of said register.

3,925,613
APPARATUS FOR EXTRACTING A VERTICAL SYNCHRONIZING PULSE FROM A COMPOSITE SYNCHRONIZING SIGNAL INCLUDED IN A VIDEO SIGNAL

Naoyuki Kokado, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed June 7, 1974, Ser. No. 477,287
Claims priority, application Japan, June 19, 1973, 48-68287
Int. Cl.² H04L *7/00*
U.S. Cl. 178—69.5 TV **5 Claims**



1. An apparatus for extracting a vertical synchronizing pulse from a composite synchronizing signal included in a video signal, comprising a synchronizing signal-separating circuit for separating a composite synchronizing signal from a video signal; a device for providing a reproduced composite synchronizing signal which comprises a first counter circuit supplied with the composite synchronizing signal and first clock pulses, reset at the rise of the respective synchronizing pulses constituting the composite synchronizing signal and designed to commence the counting of the first clock pulses starting

with the fall of the respective synchronizing pulses; a reset circuit connected to the first counter circuit so as to give forth a reset output when the first counter circuit has counted a prescribed number of the first clock pulses, and a flip-flop circuit set at the rise of the respective synchronizing pulses constituting the composite synchronizing signal, and reset by an output from the reset circuit, thereby obtaining said reproduced composite synchronizing signal containing a reproduced continuous vertical synchronizing pulse obtained by equally broadening the width of respective pulses included in the composite synchronizing signal to an extent at least larger than the width of the splits by which the vertical synchronizing pulse included in the composite synchronizing signal is previously divided at a time interval equal to half the period of a horizontal synchronizing pulse; and a device for extracting the reproduced continuous vertical synchronizing pulse from the reproduced composite synchronizing signal.

3,925,614
RECEIVER FOR THE RECEPTION OF PULSE SIGNALS TRANSMITTED BY MEANS OF FREQUENCY SHIFT MODULATION

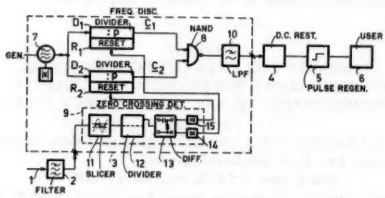
Michel Antony Marie Joseph Bousmar, Brussels, Belgium, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 30, 1974, Ser. No. 510,660

Claims priority, application Netherlands, Sept. 28, 1973, 7313361

Int. Cl.² H04L *27/14*

U.S. Cl. 178—88 **7 Claims**



1. A receiver for the reception of pulse signals transmitted by means of frequency shift modulation in which the received modulated pulse signals are applied to a frequency discriminator from which the demodulated pulse signals are derived, the frequency discriminator comprising a plurality of parallel channels whose inputs are coupled to a common generator having a fixed frequency and whose outputs are coupled to a plase comparator, each channel including a frequency divider providcd with a phase adjusting circuit, said divider having output means for providing output signals at a frequency which is equal for all channels and which is higher than the highest frequency of the received modulated pulse signals, said frequency discriminator furthermore including a zero crossing detector for generating set pulses as a function of the zero crossings in the received modulated pulse signals, said set pulses being cyclically applied to the phase adjusting circuits of the different frequency dividers, the output signals of two channels being compared in phase in the phase comparator and the demodulated pulse signals being derived from a low-pass filter coupled to the output of the phase comparator.

3,925,615
MULTI-CHANNEL SOUND SIGNAL GENERATING AND REPRODUCING CIRCUITS

Yasuaki Nakano, Hino, Japan, assignor to Hitachi, Ltd., Japan

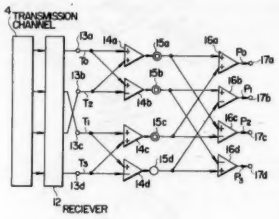
Filed Feb. 26, 1973, Ser. No. 335,741

Claims priority, application Japan, Feb. 25, 1972, 47-18949

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² H04R *5/00*

U.S. Cl. 179—1 GQ **8 Claims**



1. A matrix circuit comprising first, second, third, and fourth input terminals; first arithmetic circuit means for adding signals provided from said first and second input terminals; second arithmetic circuit means for subtracting said signal of said second input terminal from said signal of said first input terminal; third arithmetic circuit means for adding signals from said third and fourth input terminals; fourth arithmetic circuit means for subtracting said signal of said fourth input terminal from said signal of said third input terminal; first, second, and third phase shifters having a first phase shift which are respectively connected to the outputs of said first, second, and third arithmetic circuit means; a fourth phase shifter having a second phase shift connected to the output of said fourth arithmetic circuit means, fifth arithmetic circuit means for adding the outputs of said first and third phase shifters; sixth arithmetic circuit means for subtracting the output of said fourth phase shifter from the output of said second phase shifter; seventh arithmetic circuit means for subtracting said output of said third phase shifter from said output of said first phase shifter; eighth arithmetic circuit means for subtracting said output of said second phase shifter from said output of said fourth phase shifter; and first, second, third, and fourth output terminals which are respectively connected to said fifth, sixth, seventh, and eighth arithmetic circuit means; the phase difference between said first and second phase shifts being 90°.

6. Multi-channel sound system having a first matrix circuit for encoding a four directional input signal obtained from four signal sources arranged in such manner that their azimuths on a plane are spaced by approximately 90°, a plurality of transmission channels for transmitting the output signals of the signals of the first matrix circuit and a second matrix circuit for decoding the transmitted signal and reproducing directional output sound signals correlated with the input signals, wherein said matrix circuit includes first, second, third, and fourth input terminals; first, second, third, and fourth phase shifters having a first phase shift which are respectively connected to said first, second, third, and fourth input terminals; first arithmetic circuit means for subtracting a signal of said fourth input terminal from a signal of said third input terminal; a fifth phase shifter having a phase shift connected to the output of said first arithmetic circuit means; second arithmetic circuit means for producing a sum among outputs of said first, second, third, and fourth phase shifters; third arithmetic circuit means for subtracting said output of said second phase shifter from a sum between said output of said first phase shifter and an output of said fifth phase shifter; fourth arithmetic circuit means for subtracting said outputs of said third and fourth phase shifters from a sum between said outputs of said first and second phase shifters; and fifth arithmetic circuit

eans for subtracting said output of said second phase shifter id said output of said fifth phase shifter from said output of id first phase shifter; the phase difference between said first id second phase shifts being 90°;and first, second, third, and urth output terminals respectively connected to said second, ird, fourth, and fifth arithmetic circuit means.

3,925,616

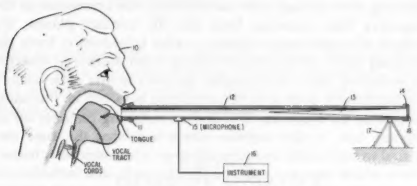
APPARATUS FOR DETERMINING THE GLOTTAL WAVEFORM

Ian Mohan Sondhi, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 30, 1974, Ser. No. 465,604

Int. Cl.[2] G10L *1/04*

U.S. Cl. 179—1 SC **8 Claims**



1. Apparatus for detecting the glottal waveform comprising:

n acoustic waveguide having a cross-sectional area substantially equal to that of the human vocal tract, said waveguide erminated at one end to substantially reduce acoustic wave eflections and adapted at the other end for physical coupling o a subject's lips; and

means positioned in the wall of said waveguide for detecting said glottal waveform.

3,925,617

TELEPHONE AUTO-ANSWERING DEVICE WITH TIME RECORDING

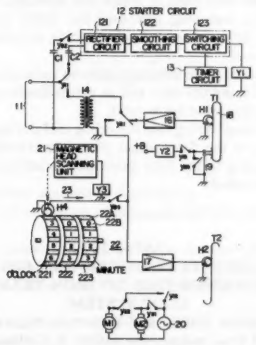
Takashi Sato, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 13, 1972, Ser. No. 305,774

Claims priority, application Japan, Nov. 16, 1971, 46-91638

Int. Cl.[2] H04M *11/00*

U.S. Cl. 179—6 R **5 Claims**



1. In a telephone auto-answering device including an answering tape and a recording tape and comprising starter circuit means responsive to an incoming calling signal from a caller for controlling an auto-answering operation of the device, a reproducing means responsive to actuation of said starter circuit means for driving the answer tape and reproducing an answer-message previously recorded on the answering tape to send out the answer-message to the caller, and recording means responsive to the termination of the answer-message send-out operation for recording the caller's message on the recording tape, the improvement comprising voice clock means coupled to said recording means and operable to reproduce a pre-recorded voice signal indication of the time, timer means automatically operating said voice clock means at preset intervals for continually recording said voice signal time indications on the recording tape at said preset intervals, and means for preventing said recording means from recording the time indications on the recording tape when said recording means is recording the caller's message.

3,925,618

VOICE SWITCH CIRCUITS FOR USE IN LOUDSPEAKING TELEPHONE CIRCUITS

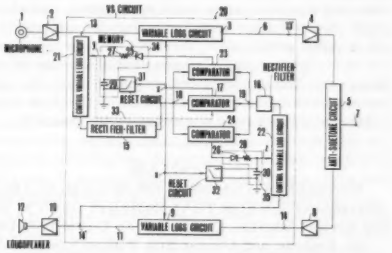
Kunihiro Kato, Hachiaji; Ryoichi Matsuda, Musashino, and Ryoichi Okayasu, Tokyo, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Feb. 12, 1975, Ser. No. 549,192

Claims priority, application Japan, May 2, 1974, 49-48683

Int. Cl.[2] H04M *1/60*

U.S. Cl. 179—1 VC **15 Claims**



1. In a voice switch circuit for use in a loudspeaking telephone circuit of the class comprising a main comparator for comparing the signal level of a receiving circuit with the signal level of a transmitting circuit, a transmitting variable loss circuit responsive to a condition wherein the signal level of the receiving circuit is higher than the signal level of the transmitting circuit for inserting a loss in the transmitting circuit thereby establishing a receiving condition, and a receiving variable loss circuit responsive to a condition wherein the signal level of the transmitting circuit is higher than the signal level of the receiving circuit for inserting a loss in the receiving circuit thereby establishing a transmitting condition, the improvement wherein said voice switch circuit comprises a control variable loss circuit inserted between said receiving circuit and said main comparator, a second comparator for comparing the output signal level from said control variable loss circuit with the signal level of said transmitting circuit, and means connected between said second comparator and said control variable loss circuit for operating said control variable loss circuit under the receiving condition for decreasing the level difference between two inputs of said main comparator.

3,925,619

APPARATUS FOR TRANSMITTING INFORMATION REGARDING MONETARY TRANSACTIONS

Ralph Charles Freethy, Barnhay House, Barnhay, Churchdown, Gloucester, England

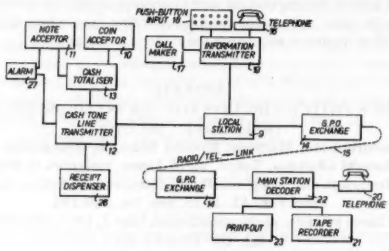
Filed Mar. 25, 1974, Ser. No. 454,767

Int. Cl.[2] G07G *5/00*

U.S. Cl. 179—6.3 R **13 Claims**

1. The combination of apparatus for enabling monetary transactions to be transmitted from a plurality of local stations to a main station and recorded thereat, wherein each local

station apparatus comprises a cash accepting and validating device, an encoding signal generator arranged to produce a different coded signal sequence for each cash value registered by the cash accepting and validating device, wherein the main station apparatus incorporates a synchronising signal generator for producing clock pulses to be passed to the local station to initiate and control the timing of the signal sequence from the encoding signal generator, an information transmitter



arranged for transmitting the signal sequence produced by the encoding signal generator to the main station, and wherein the main station further includes a decoder controlled by the clock pulses produced by the synchronising signal generator for receiving the signal sequence produced by the information transmitter and decoding that sequence when the signal sequence is substantially synchronised with the clock pulses, and a data recording device controlled by the decoder.

3,925,620

METHOD OF TRANSFER OF SWITCHING ORDER INFORMATION FOR TRANSMISSION OF PCM WORDS

Nils Herbert Edström, Stockholm; Stig Gustaf Wilhelm Lindqvist, Enskede, and Gunnar Erik William Sparrendahl, Handen, all of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

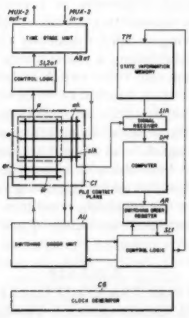
Filed Jan. 22, 1973, Ser. No. 327,612

Claims priority, application Sweden, Feb. 8, 1972, 1445/72

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] H04J *3/00*

U.S. Cl. 179—15 AT **3 Claims**



1. In a multichannel time division multiplex system for handling PCM words which has incoming and outgoing links connected to an exchange comprising a first time stage, a space stage and a second time stage wherein during time slots of frames indicated by time slot numbers the PCM words are transferred from the first time stage via the space stage to the second time stage wherein the space stage is divided into a number of file contact planes, each of which has an incoming transfer file connected to an associated switching order unit having register means, and has incoming and outgoing files connected to associated respective substages in the first and second time stage, respectively, and wherein each substage is connected to links associated with the respective substage among the incoming and outgoing links to and from the exchange, so that the number of file contact planes corresponds to the number of outgoing and incoming files from and to any one of the substages in the first and second time stage, a substage in the first time stage and a substage in the second time stage forming part of a common time substage, each furthermore including switching order memories which, for receiving of switching order information, are connected to the respective files outgoing from the file contact planes, the method of transferring switching order information from the switching order units to the switching order memories wherein the switching order information includes in the case when a communication path is to be connected between an incoming channel on an incoming link and an outgoing channel on an outgoing link, a slot number which indicates the time slot allotted to such path, and time substage addresses and channel indices which together indicate the channels, and including, in the case the path is to be disconnected, the substage address indicating the incoming link and the slot number which have been used during the connection, and instead of the channel indices and the substage address indicating the outgoing link, used during the connection, such indices and such an address which cannot be used for any connection, the method comprising the steps of:

selecting definite time slots during which only switching order information, and not PCM words, is transferred on the files outgoing from the file contact planes,

dividing each of said definite time slots into two portions,

storing the switching order information in the register means of one of the switching order units,

transferring from the respective register means to the transfer file of the switching order unit, said slot number in each of the first portions of said definite time slots, and reading from the respective register means the substage address indicating the outgoing link and the channel indices in their respective second portions of said definite time slots,

decoding the substage address indicating the incoming link during the time slots in which the substage address indicating the outgoing link and the index indicating the outgoing link and the index indicating the incoming channel are read,

further decoding the substage address indicating the outgoing link during the time slot in which the index indicating the outgoing channel is read,

and connecting during said decoding and during said further decoding in the file contact plane the transfer file to the file outgoing to the time substage the address of which is being decoded.

3,925,621

DIGITAL CIRCUIT SWITCHED TIME-SPACE-TIME SWITCH EQUIPPED TIME DIVISION TRANSMISSION LOOP SYSTEM

Arthur A. Collins, Dallas, and Robert D. Pedersen, Richardson, both of Tex., assignors to Arthur A. Collins, Inc., Dallas, Tex.

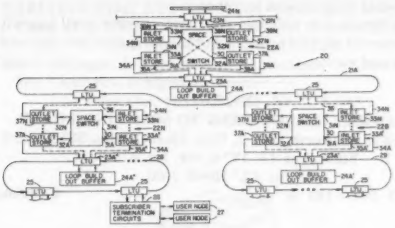
Filed Jan. 17, 1974, Ser. No. 434,198

Int. Cl.[2] H04J *3/06*

U.S. Cl. 179—15 AL **17 Claims**

1. In a loop digital telecommunications system: interconnection of time-space-time digital switching node means in a distributed loop switching system; a plurality of time division transmission loops interconnected by said time-space-time

digital switching node means wherein user terminal-to-terminal connections are established through interconnected time-space-time switching nodes and connected loops in the circuit



prior to commencing communication; a loop build-out buffer in each of said plurality of time division transmission loops; and timing means connected through said time-space-time digital switching node means to each of said build-out buffers.

3,925,622

TELEPHONE APPARATUS

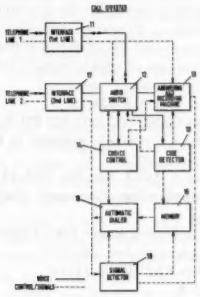
Stephen Perrin Robinson, Camberley, England, assignor to Ansafone Limited, England

Filed Feb. 14, 1974, Ser. No. 442,607

Claims priority, application United Kingdom, Feb. 16, 1973, 7783/73

Int. Cl.[2] H04M *3/42*

U.S. Cl. 179—18 BE **6 Claims**



1. A telephone apparatus comprising:

means for receiving an incoming telephone call over a first line;

means for announcing to the caller that an attempt will be made to divert the call to another telephone number;

means for automatically dialling a predetermined telephone number;

means for initiating operation of the automatic dialling means over a second line;

means for verifying a coded response to the automatically dialled call;

means for connecting the incoming call to said predetermined number only in the event of a correctly coded response to said automatically-dialled call; and

means for inhibiting further automatic dialling to said predetermined number in the absence of a correctly coded response to the automatically dialled call.

3,925,623

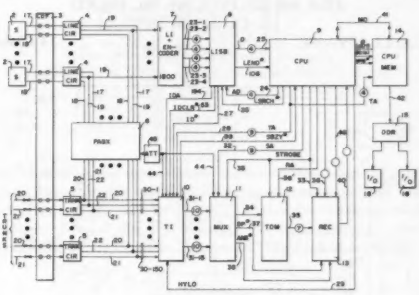
LINE IDENTIFICATION AND METERING SYSTEM

Harold Tysseland, Cupertino, Calif., assignor to TRW Inc., Los Angeles, Calif.

Filed Mar. 8, 1974, Ser. No. 449,384

Int. Cl.[2] H04M *15/06*

U.S. Cl. 179—18 FH **21 Claims**



1. A message metering apparatus for operation with a telephone system having station lines and trunk lines, having a switching exchange for connecting the station lines to the trunk lines, said apparatus comprising,

sensing means for sensing the busy condition of a busy trunk line,

generator means for generating an identification signal for transmission on said busy trunk line through said exchange to a station line connected to said busy trunk line, said generator means including means for generating said identification signal as a plurality of digital pulses,

detector means connected to said station lines for detecting the presence of said identification signal on said station line connected to said busy trunk line whereby the presence of said identification signal on said station line identifies said station line.

3,925,624

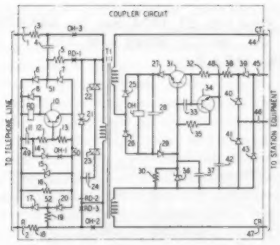
COUPLING CIRCUIT FOR PROVIDING BILATERAL PROTECTION FROM HAZARDOUS VOLTAGES

Harold Westly Earle, New Shrewsbury, and Joseph Robbins, Marlboro, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 27, 1974, Ser. No. 536,732

Int. Cl.[2] H04M *1/00*

U.S. Cl. 179—81 R **14 Claims**



1. A circuit for providing a two-way signaling path between a telephone line and station equipment including means for limiting the amplitude of signals on the signaling path to provide hazardous voltage protection, and means responsive to ringing signals from the telephone line for disabling the limiting means, characterized in that the circuit further includes, means responsive to the presence of station generated signals

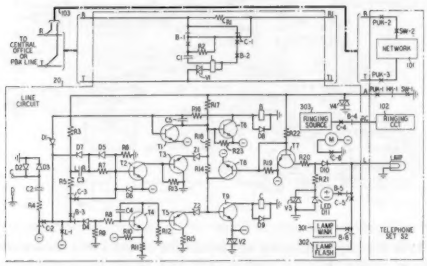
exceeding a predetermined amplitude for preventing the disabling of the limiting means.

3,925,625

TRANSIENT CONTROLLED TELEPHONE LINE CIRCUIT

Ronald Joseph Angner, Freehold, and Alexander Feiner, Rumson, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 25, 1974, Ser. No. 491,823
Int. Cl.[2] H04M *1/00*
U.S. Cl. 179—99 **14 Claims**



1. A line circuit for use in controlling communication services between a telephone switching machine and a telephone station, said line circuit adapted for connection in parallel across the communication conduction pair between said switching machine and said telephone station and adapted for A-lead control from said station, said line circuit means including

hold means operable for maintaining a connection from said switching machine in an active noncommunicating condition,

means for detecting signals on said A lead,

means for providing transition control signals upon any transition of said telephone station from an off-hook condition to an on-hook condition, said transition control signals being provided in response to the transient signal generated when said telephone station becomes disconnected from said conduction pair, and

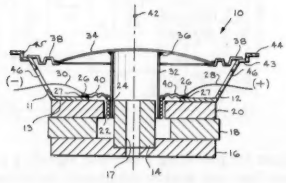
means for enabling said hold means upon a detected signal from said A lead and the absence of said telephone station transition control signals.

3,925,626

DYNAMIC SPEAKER HAVING DOME DIAPHRAGM AND BASKET FRAME

Robert John Stallings, Jr., P.O. Box 230, Sugarland, Tex. 77478

Filed Feb. 22, 1974, Ser. No. 444,825
Int. Cl.[2] H04R *9/06, 1/02*
U.S. Cl. 179—115.5 R **6 Claims**



3. A dynamic loudspeaker comprising a framework, a magnet structure secured to one end of the framework and having an air gap as said end, an outwardly convex, rigid diaphragm disposed at the other end of said framework with its outer periphery resiliently supported thereon, a voice coil form having one end secured to the center portion of

said diaphragm on the concave side thereof and extending to said magnet with its other

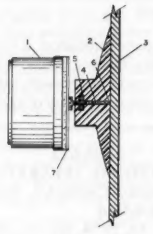
end disposed in said air gap, and a voice coil securely mounted on said other end of the form and also disposed in said air gap.

3,925,627

TRANSDUCER MOUNTING TO SOUNDING BOARD

William J. Ashworth, Rte. 2, New Albany, Miss. 38652

Filed June 13, 1974, Ser. No. 478,937
Int. Cl.[2] H04R *1/00*
U.S. Cl. 179—181 W **4 Claims**



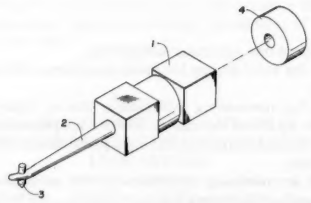
1. An inertia type electro-mechanical audio transducer in combination with a vacuum cup and a sounding board wherein said vacuum cup is secured to said sounding board by a vacuum seal formed therebetween, said inertia type electro-mechanical audio transducer comprises a vibratory transfer means which extends through said vacuum cup to make solid contact with said sounding board for the transfer of vibratory energy from said transducer to said sounding board for acoustic reproduction, wherein said vacuum cup is the sole support of said transducer by means of said vibratory transfer means.

3,925,628

ELECTROMAGNETIC SOUND PICK-UP

Hans-Robert Kühn, Kiel, Germany, assignor to Electroacustic GmbH Kiel, Kiel, Germany

Filed June 1, 1973, Ser. No. 365,841
Claims priority, application Germany, July 20, 1972, 2235484
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] H04R *11/12*
U.S. Cl. 179—100.41 K **2 Claims**



1. An electromagnetic sound pick-up armature for reproduction of stereo sound signals having 90° phase shift between individual channels comprising an armature secured to a needle carrier, said armature being elastically deflectable with uniform stiffness in all deflection directions, the cross section of the armature being cylindrical in the region of its mounting and quadrilateral in the part of its length, which is adapted to

be inserted between the ends of two pole shoes of a magnetic pick-up.

3,925,629

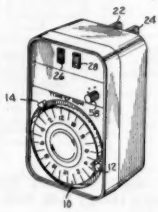
VARIABLE TIME SWITCH WITH VARIABLE CONTROL CAM STRUCTURE FOR DIFFERENT TIME PERIODS AND MODES OF OPERATION

Harry Albinger, Jr., Ashland, Mass., assignor to General Electric Company, Bridgeport, Conn.

Filed Oct. 16, 1974, Ser. No. 515,143

Int. Cl.² H01H *43/10*

U.S. Cl. 200—38 R **18 Claims**



1. A time switch comprising:

a. electrical switch means having closed ON positions and open OFF positions;

b. switch actuator means positioned adjacent to said switch means for actuating said switch means to an ON or an OFF position;

c. a time of day member continuously rotated as a function of time positioned adjacent to said switch actuator, said time of day member having an OFF member selectively positionable on said time of day member for moving said switch actuator to cause said switch actuator to operate said switch means to an open OFF position, and an ON member selectively positionable on said time of day member for operating said switch actuator to move said switch means to a closed ON position; and

d. said switch actuator means including a first cam means arranged for engagement with said switch means for opening and closing said switch means at the same times during a number of consecutive complete rotations of said time of day member at the times set by said slectively positionable ON and OFF members, and said switch actuator including a second cam means positioned adjacent to said switch means for opening and closing said switch means at different times than the times set by said selectively positionable ON and OFF members for opening and closing said switch means at different times during consecutive complete rotations of said time of day member; and

e. selector means for manually selecting operation of said switch means by said first cam means or said second cam means of said switch actuator.

3,925,630

TIMER SWITCH ASSEMBLY HAVING LATCH ASSEMBLY FOR PREVENTING CONTACT ENGAGEMENT

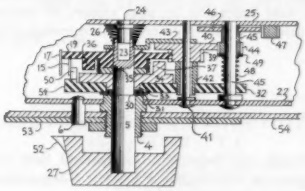
John L. Harris, Clearwater, Fla., assignor to Deltrol Corporation, Bellwood, Ill.

Filed Dec. 19, 1974, Ser. No. 534,359

Int. Cl.² H01H *43/10*

U.S. Cl. 200—39 R **13 Claims**

9. In a push to start timer, a cam having a drop off lobe on its periphery, said cam including axially movable and rotatable mounting means, means including a timer motor for rotating the cam, and outer flexible switch blade having one end fixed and having a free end adapted for engagement with the cam lobe, an inner flexible switch blade having one end fixed and a free end adapted for engagement with the cam lobe, both of said blades being biased toward the cam and the outer blade extending beyond the inner blade over the cam lobe causing the inner blade to move away from the outer blade when the



cam rotates to the point where the cam lobe drops the inner blade, the cam and outer blade being arranged so that axial movement of the cam in one direction drops the outer blade from the side of the cam, causing the outer blade to move toward the inner blade in response to the axial movement.

3,925,631

CONTACT ARRANGEMENT FOR A HIGH-VOLTAGE POWER CIRCUIT BREAKER

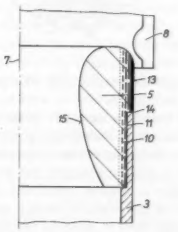
Claus Kessler, and Helmut Beier, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 23, 1973, Ser. No. 353,365

Claims priority, application Germany, Apr. 28, 1972, 2221630

Int. Cl.² H01H *33/60*

U.S. Cl. 200—148 R **6 Claims**



1. In a high-voltage, compressed gas power circuit breaker wherein the gas is blown through the arc developed when the breaker is switched, a contact arrangement whereat the circuit breaker is switched between open and closed positions, the contact arrangement comprising at least two metal contact pieces having respective hollow interiors for accommodating the discharge of the gas blown through the arc, arcing electrodes between which the arc is drawn when the breaker is switched to the open position, said contact pieces being mounted in the breaker so as to conjointly define a gap therebetween, and a bridging contact member movable relative to said contact pieces between open and closed positions to electrically join said contact pieces in the closed position and to electrically separate said contact pieces in the open position whereby the arc is drawn when said gap is opened, said bridging contact member being arranged with respect to said contact pieces so as to cause said bridging contact member to slide over the electrode of at least one of said contact pieces when moving into said open position from said closed position, said arcing electrodes being electrically and mechanically joined to said contact pieces respectively, each of said arcing electrodes and the corresponding contact piece conjointly defining an interface whereat the arcing electrode is joined to the contact piece, said arcing electrodes being made from carbon bodies and having a nozzle-like configuration,

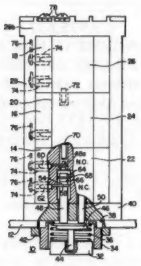
and an electrically conductive supplement embedded in each of said electrodes in the region thereof next to said interface to increase the conductivity of said carbon electrode at said region to mitigate the discontinuity in conductivity between said carbon electrode and said metal contact piece at the joint therebetween and to also impart an increased mechanical strength to said electrode at said region to increase the strength of said joint, said supplement comprising at least one metal.

3,925,632

PUSHBUTTON SWITCH WITH SEPARABLE SWITCH UNITS

Stanley L. Frank, and Stephen S. Dobrosielski, both of Beaver, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 15, 1974, Ser. No. 470,106
Int. Cl.[2] H01H *9/00*
U.S. Cl. 200—307 **6 Claims**



1. A switch comprising a plurality of separable switch units, the switch units being stacked in end-to-end abutment and having side walls facing a uniform direction, each unit comprising at least one set of stationary contacts and cooperable movable contacts, movable contact operating means for each unit and including a guided plunger, the plungers of the switch units being movable in unison, pushbutton switch means disposed at one end of the stacked switch units to effect movement of the plungers, first conductor means leading from each set of stationary contacts and comprising terminals at said side walls, a terminal strip of electrically insulating material extending along said side walls and having second conductor means comprising a separate terminal receptacle for each terminal, the terminal strip being coextensive with the stacked switch units, the second conductor means comprising terminal connectors at the end of the strip remote from the pushbutton switch means, the second conductor means also comprising conductors in the strip and extending from the terminal receptacles to the terminal connectors, the terminal strip comprising a longitudinal portion and a transverse portion, the longitudinal portion extending adjacent to said side walls, and the transverse portion extending across the end of the switch unit remote from the pushbutton switch means.

3,925,633

CIRCUIT FOR CONTROLLING POWER FLOW FROM A HIGH FREQUENCY ENERGY SOURCE TO A PLURALITY OF HIGH FREQUENCY LOADS

Donald F. Partridge, 1036 Harlen Drive, San Jose, Calif. 95129

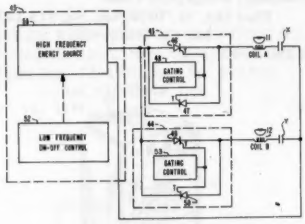
Filed Sept. 6, 1974, Ser. No. 503,781
Int. Cl.[2] H05B *5/04*
U.S. Cl. 219—10.49 **10 Claims**

1. An inductive heating apparatus for supplying energy to one or more induction heating coil loads comprising:

a high frequency energy source suitable for heating said load by an inductive heating effect;

on-off switching means to cycle said energy source on and off at a frequency rate substantially lower than the high frequency rate of the energy source; and

interconnecting circuit means connecting said source and said load for supplying energy to the load, said interconnecting circuit means including individual switching means for impeding energy flow from the source to the load, said individual switching means being capable of impeding energy flow after each time said on-off switching means cycles said energy source off and being capable of initiating energy at any time interval following the cycling on of the energy source.

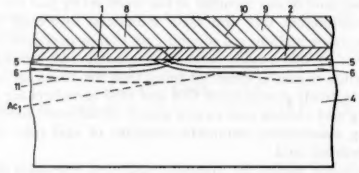


3,925,634

PROCESS FOR WELDING A CLADDING ONTO A BASE MATERIAL

Jan Pieter Fokke Mulder, Rotterdam, Netherlands, assignor to De Rotterdamsche Droogdok Maatschappij B.V., Rotterdam, Netherlands

Filed June 7, 1972, Ser. No. 260,455
Claims priority, application Netherlands, June 10, 1971, 7107977
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.[2] B23K *9/04*
U.S. Cl. 219—76 **3 Claims**



1. A process for welding a cladding onto a steel base material, the process comprising the steps of: cladding a first thin buffer layer of stainless steel cladding material onto said base material at a first welding speed and at a first welding temperature so that a region of said base material, near the cladded surface thereof, is austenitized to the extent that a course-grained region is developed; and cladding a second layer of stainless steel cladding material onto said first thin layer of cladding material at a second welding speed and a second welding temperature so that said course-grained region of base material is recrystallized to the extent that it is converted to a fine-grained region, and so that the temperature conditions which resulted in the development of the course-grained region of base material during the cladding of the first thin layer of cladding material are restricted to the boundaries of said first thin layer of cladding material.

3,925,635
PRESSURE OPERATED CONTROL FOR RESISTANCE WELDING MACHINES

Bernd Schneider, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

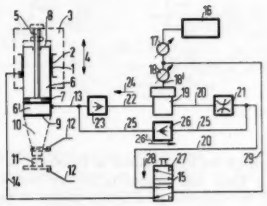
Filed Nov. 15, 1973, Ser. No. 415,957

Claims priority, application Germany, Nov. 23, 1972, 2257537

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² B23K *11/10*

U.S. Cl. 219—89 **9 Claims**



1. In a pressure actuated control for energizing the electrodes of a resistance welding machine having a stationary anvil electrode,

a movable presure electrode,

means engaging pressure electrodes with a workpiece between said electrodes and pressurizing the pressure electrode to a predetermined pressure,

a source of fluid under pressure,

a fluid pressure cylinder,

a piston within said cylinder,

pressure inlets into said cylinder on opposite sides of said piston,

the admission of fluid under pressure to one side of said piston raising the pressure electrode above the workpiece and pressure on the opposite side of said piston engaging the pressure electrode with the workpiece,

a pressure-dependent triggering switch controlling the energization of said electrodes,

a first valve controlling the supply and release of fluid under pressure to opposite sides of said piston,

a pressure supply line from said source of supply of fluid under pressure to said first valve,

individual first and second pressure lines leading from said first valve to said cylinder, on opposite sides of said piston,

a second valve operated by fluid under pressure for controlling the supply of fluid under pressure to effect lowering of the pressure electrode to engage the workpiece with a predetermined pressure,

means for setting the pressure of closing of said pressure switch to a pre-set pressure of engagement of said pressure electrode with the workpiece,

including a throttle valve,

an operative connection from said second valve to said pressure-dependent switch, to effect closing of said switch upon the building of a predetermined pressure on the workpiece by said pressure electrode,

a check valve holding fluid under pressure in the end of said cylinder pressurizing said pressure electrode,

a bridging line bridging said first check valve and said second valve and having a check valve therein set to prevent the building up of pressure in said bridging line and to accommodate the release of fluid under pressure in the end of said cylinder pressurizing said pressure electrode.

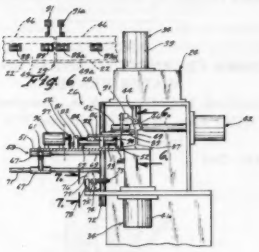
3,925,636
METHOD AND MACHINE FOR AXIALLY ALIGNING AND WELDING CONTINUOUS RAIL

William R. Coleman, Earlham, Iowa, assignor to Darrell L. Dehm, Eldon, Iowa, a part interest

Filed Aug. 15, 1974, Ser. No. 497,520

Int. Cl.² B23K *11/02*

U.S. Cl. 219—104 **4 Claims**



3. The method for forming a single continuous elongated unit from a plurality of like elongated members having adjacent end sections axially aligned and butt welded together comprising:

a. supporting adjacent end sections of said elongated members in an end to end relation with opposing end faces thereof in abutting engagement,

b. electrically sensing said adjacent end sections for lateral misalignment of one of the corresponding side surfaces thereof,

c. relatively moving said end sections a predetermined increment distance toward laterally aligned positions therefor in response to each sensing operation,

d. terminating the sensing operation when the corresponding side surfaces of the end sections are in lateral alignment,

e. vertically adjusting the end sections into axial aligned positions therefor, and then

f. butt welding said end sections together.

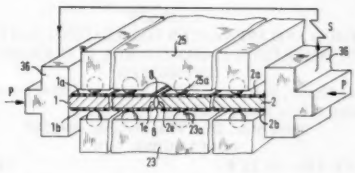
3,925,637
RESISTANCE WELDING

Otto Alfred Becker, Robert-Koch-Strasse 59, 66 Saarbruecken 6, Germany

Division of Ser. No. 238,918, March 28, 1972, Pat. No. 3,805,014. This application Dec. 28, 1973, Ser. No. 429,111

Int. Cl.² B23K *11/02*

U.S. Cl. 219—105 **5 Claims**



1. The method of resistance welding of coated metal articles to each other along the adjacently disposed cut edges thereof by means of electric current, comprising the steps of:

a. milling out by means of a milling cutter a substantial thickness of the cut edge of each of said metal articles to be welded so as to form a plurality of linear contact surfaces on each of said cut edges,

b. establishing pressure contact of said linear contact surfaces on the opposed cut edges of said articles, and

c. supplying electric welding current by current conducting means to one of the metal articles at a region spaced from said linear contact surfaces, said current travelling through said one metal article and said contact surfaces to the other metal article thereby effecting welding, the current being conducted away from the other one of the metal articles at a region spaced from said contact surfaces, whereby the metal articles are welded only in the weld area defined by said contact surfaces.

3,925,638

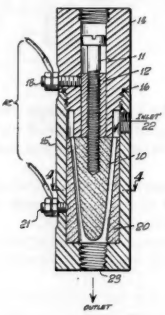
ELECTRODE CLEANING MEANS IN AN ELECTRIC WATER HEATER

Guido J. Scatoloni, 1942 Gladwick St., Compton, Calif. 90220

Filed June 20, 1973, Ser. No. 371,740

Int. Cl.[2] H05B *3/60*

U.S. Cl. 219—295 **11 Claims**



1. A flow through electric water heater of the type having a plurality of carbon-containing electrodes held in a spaced apart relationship within the body of said heater and having means for supplying an alternating current potential between adjacent electrodes wherein the improvement comprises:

electrode cleaning means comprising at least two electrodes, each of said electrodes containing a substantial amount of carbon, an electrical circuit adapted to supply a direct current potential of between **6** and **220** volts between adjacent electrodes for an intermittant time interval sufficient to clean said electrode, said electric circuit further being adapted to provide each electrode in said heater with a positive charge with respect to an adjacent electrode whereby deposits are removed from the surface of an electrode during the time at which a positive charge is applied thereto.

3,925,639

METHOD AND APPARATUS FOR READING BAR CODED DATA WHEREIN A LIGHT SOURCE IS PERIODICALLY ENERGIZED

Gerald Hester, Santa Ana, Calif., assignor to MSI Data Corporation, Costa Mesa, Calif.

Filed Mar. 25, 1974, Ser. No. 454,585

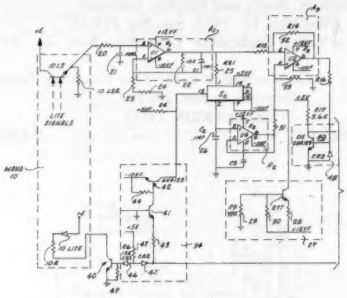
Int. Cl.[2] G06K *7/10*

U.S. Cl. 235—61.11 E **24 Claims**

1. Apparatus for optically reading bar coded data wherein the binary bits are encoded in terms of bars of different widths of the same optical characteristic separated by areas of the opposite optical characteristic comprising

optical sensing means for producing electrical signals representative of the optical characteristic of a surface presented thereto upon the production of relative movement between the surface and the sensing means, said sensing means having a normally de-energized light source and a light sensor for receiving the light rays from the light source reflected from the surface being sensed, and

control circuit means including means for automatically and periodically energizing the light source coupled to be responsive to the sensor signals and maintaining the energization of the light source in response to a sensor signal of one kind and automatically de-energizing the light source in response to a sensor signal of the other kind.



3,925,640

CLOSED LOOP CONTROL SYSTEM HAVING PLURAL MODES OF OPERATION

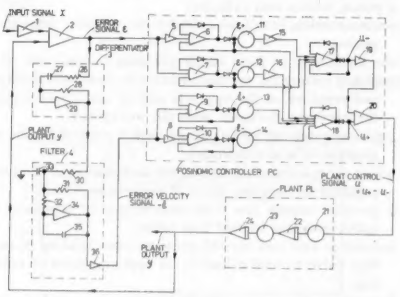
Matthew Duggan, Hemel Hempstead, England, assignor to Rolls-Royce (1971) Limited, London, England

Filed Mar. 4, 1974, Ser. No. 447,829

Claims priority, application United Kingdom, Mar. 6, 1973, 10678/73; Apr. 14, 1973, 18100/73

Int. Cl.[2] G06B *13/02*

U.S. Cl. 235—150.1 **9 Claims**

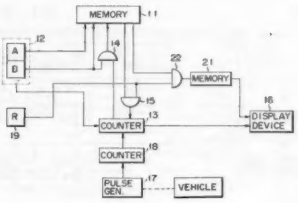


1. A closed loop control system for controlling a plant in accordance with an input signal to the control system, the system comprising means for receiving an input signal into the plant, means for generating a plant output signal, a comparator for comparing the input and output signals to produce an error signal proportional to the difference between the input and output signals, means for producing an error velocity signal proportional to the rate of change of the error signal, means responsive to said error and said error velocity signals for generating at least two different linear functions of the error and error velocity signals, each of said linear functions corresponding to a different mode of operation of said control system, means for changing from one linear function to another depending upon a predetermined ratio between the error signal and the error velocity signal, and means for producing a continuous plant control signal varying in accordance with one of said linear functions.

3,925,641
ROUTE GUIDING APPARATUS

Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Higashiyamato, Japan

Filed May 3, 1974, Ser. No. 466,701
Claims priority, application Japan, May 8, 1973, 48-50915
Int. Cl.² G06F *15/50*
U.S. Cl. 235—150.2 **15 Claims**



1. A route guiding apparatus comprising:

means for generating pulses as a function of the rotation of the wheels of a vehicle such as an automobile, a motorcycle, a bicycle or the like, for each specified increment of distance covered by said vehicle;

counting means coupled to said pulse generating means for counting the pulses from said pulse generating means so as to measure the distance covered by said vehicle;

first indicating means coupled to said counting means for displaying a distance data item corresponding to the covered distance obtained by said counting means;

input means for supplying a direction data item indicating "right turn," "left turn" or "go-straight" guiding

write-in means coupled to said input means for pairing said distance data and said direction data item into a route segment data item upon receipt of said direction data from said input means;

memory means coupled to said write-in means for sequentially storing a plurality of route segment data items from said write-in means;

instructing means for instructing read-out of the route segment data items from said memory means;

read-out means responsive to instructions from said instructing means for reading out controllably and sequentially a plurality of route segment data items from said memory means, each route segment data item including a distance data item corresponding to the distance of a route segment to be covered by said vehicle and a direction data item corresponding to the direction of the next route segment to be covered;

second indicating means coupled to said memory means for displaying the direction data item read out from said memory means; and

third indicating means coupled to said memory means for displaying the remaining distance of a route segment and including means for reducing the number of pulses defining the distance data item read out by said read-out means as the vehicle advances along the route segment to generate signals corresponding to said remaining distance of a route segment.

3,925,642
STRAPDOWN GYRO DRIFT CALCULATOR

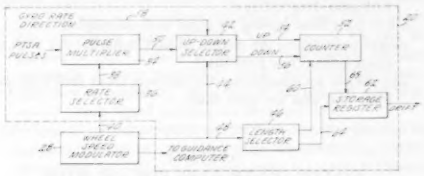
James P. Roantree, West Hartford, and John Saunders, East Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 13, 1974, Ser. No. 469,191
Int. Cl.² G06F *15/50*
U.S. Cl. 235—150.25 **8 Claims**

1. In a control system containing a strapdown gyro having a rotating wheel, said gyro being subject to external angular motion and producing an output signal which contains a component proportional to true angular motion and a component proportional to gyro drift, the improvment of means for determining the gyro drift component comprising

means for cyclically modulating the rotation speed of said gyro wheel wherein the speed of said gyro wheel is increased during one portion of said modulation cycle and decreased during another portion of said modulation cycle, said gyro output signal being correspondingly modulated by said cyclic modulation means,

means for producing a first product signal including means for multiplying the output signal from said gyro, during the portion of the modulation cycle when the gyro wheel



speed rotation is increased, by a first multiplication factor which comprises the average change in wheel speed rotation during said modulation cycle minus a preselected integral number,

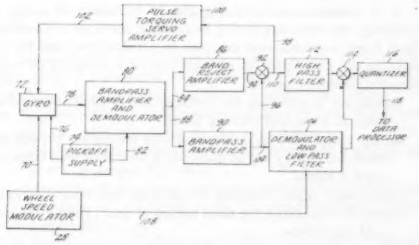
means for producing a second product signal including means for multiplying the output signal from said gyro, during the portion of the modulation cycle when the gyro wheel speed rotation is decreased, by a second multiplication factor which comprises the average change in wheel speed rotation during said modulation cycle plus said preselected integral number,

and means for subtracting one of said first and second product signals from the other said product signal.

3,925,643
DRIFT CORRECTING GYRO SYSTEM USING FILTERS

James P. Roantree, West Hartford; John Saunders, East Hartford, and Robert A. Baum, Canton, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 13, 1974, Ser. No. 469,190
Int. Cl.² G06F *15/50*
U.S. Cl. 235—150.25 **6 Claims**



1. In a control system containing a strapdown gyro which is subject to external angular motion and which produces an output signal containing a component proportional to true angular motion and a component proportional to gyro drift, said gyro having a rotating wheel, the improvement of eliminating the drift component from the gyro output signal comprising

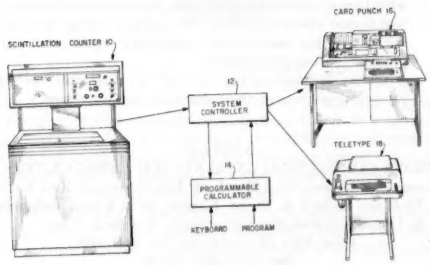
means for cyclically modulating the speed of rotation of said gyro wheel to produce a modulation component in said gyro output signal,

a band-pass amplifier having an input and an output and tuned to the wheel speed modulation frequency,
a band-reject amplifier having an input and an output and tuned to the wheel speed modulation frequency,
means for connecting said gyro output signal to the inputs of said band-pass amplifier and said band-reject amplifier,
a summing junction connected to the outputs of said band-pass amplifier and said band-reject amplifier,
a high pass filter having an input and an output,
means connecting said summing junction with the input to said high pass filter,
a demodulator having an input and an output and tuned to the wheel speed modulation frequency,
means connecting the output from said band-pass amplifier with said demodulator,
a low pass filter having an input and an output,
means connecting the output of said demodulator with the input of said low pass filter,
and means for combining the outputs from said high pass filter and said low pass filter.

3,925,644
SYSTEM CONTROLLER FOR USE WITH RADIOLOGICAL ASSAY SYSTEM

Steven C. Bergman, Old Tappan; Thomas B. Gnirrep, Kinnelon, and Charles A. Nazzaro, Hillsdale, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Feb. 4, 1974, Ser. No. 439,202
Int. Cl.[2] G06F *15/20*
U.S. Cl. 235—151.3 **10 Claims**

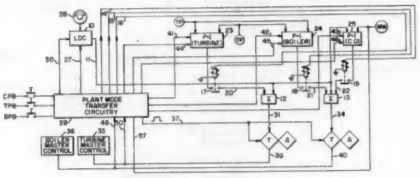


1. A system controller for use in radiological assays for coupling raw data appearing in decimal form on a plurality of lines from a scintillation counter to a calculator and for connecting the calculator to at least one of a plurality of output devices, comprising
means for converting the voltage levels appearing on said lines to a second voltage level,
means responsive to said converting means for producing a multi-bit binary signal indicating which of said lines contains a signal,
multi-stage register means for storing said binary signal,
means for coupling the data stored in said register means to said calculator,
additional register means for storing characters in binary form transmitted by said calculator,
a timing pulse generator,
gating means connected to said timing pulse generator for cyclically connecting said calculator and additional register means at preselected times when said calculator is generating output data, and
control means connected to said timing pulse generator and said additional register means for selectively coupling said additional register means to said output devices, said control means being responsive to the information stored in said additional register means.

3,925,645
SYSTEM AND METHOD FOR TRANSFERRING BETWEEN BOILER-TURBINE PLANT CONTROL MODES

Louis P. Stern, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 7, 1975, Ser. No. 556,363
Int. Cl.[2] F01D *17/02*; **G05B** *15/02*
U.S. Cl. 235—151.21 **15 Claims**

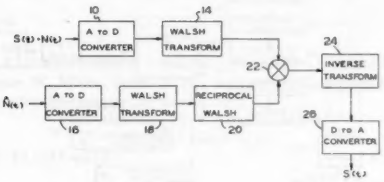


1. A system for transferring a boiler turbine power plant from one operating mode to another rapidly without disturbing the plant process wherein predetermined selected in service feedback loops trim a feedforward signal for controlling the boiler and turbine in each operating mode and at least one feedback loop is put in service for changing operating modes, said system comprising
a turbine control apparatus for controlling turbine inlet valve position in accordance with the value of an input signal,
a boiler control apparatus for controlling boiler firing rate in accordance with the value of an input signal,
means to generate a feedforward signal representative of desired plant operation connected electrically to input the feedforward signal to the boiler and turbine control apparatus in parallel,
at least one feedback loop for each control apparatus to generate an output signal,
first circuit means including each feedback loop to modify the value of the input signal to the boiler and turbine apparatus in accordance with the output signal value of its associated feedback loop that is in service for a distinct operating mode,
mode transfer selection means effective when activated to govern the turbine and boiler control apparatus to be unresponsive to a change in the value of either a feedforward or feedback signal to prevent any change in turbine valve position and boiler firing rate during a mode transfer,
second circuit means including the feedforward signal generating means governed by the activation of the transfer means to modify the generated feedforward signal to be representative of a selected value in accordance with the operating mode selected by the mode transfer means,
third circuit means governed by the activated transfer means to control each feedback loop put in service in accordance with the selected operating mode to generate a feedback output signal for the first circuit means having a value to modify the input signal for the turbine and boiler control apparatus to be representative of the value of the turbine and boiler control apparatus input signal upon activation of the transfer means, and
means deactivating the transfer means to render the boiler and turbine control apparatus responsive to their respective input signal from the signal generating means as modified by the first circuit means.

3,925,646
INFORMATION AND PROCESS CONTROL ENHANCEMENT SYSTEM EMPLOYING SERIES OF SQUARE WAVE COMPONENTS

Richard L. Richardson, Kennewick; Bernard P. Hildebrand, Richland, and Robert E. Mahan, Kennewick, all of Wash., assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Apr. 19, 1974, Ser. No. 462,372
Int. Cl.[2] G06F *15/34*
U.S. Cl. 235—152 **18 Claims**



1. Apparatus for combining a pair of inputs, said apparatus including means for representing each input as a series expansion of square wave components,

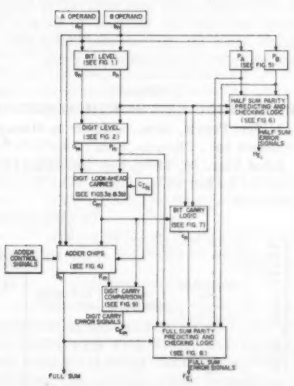
means for generating the reciprocal of one said series expansion of square wave components as a third series of square wave components,

and means for combining said third series of square wave components with the remaining series expansion of square wave components to provide an output.

3,925,647
PARITY PREDICTING AND CHECKING LOGIC FOR CARRY LOOK-AHEAD BINARY ADDER

Ming H. Louie, Norristown, Pa., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Sept. 30, 1974, Ser. No. 510,674
Int. Cl.[2] G06F *11/10*
U.S. Cl. 235—153 BB **10 Claims**



1. In combination with a carry look-ahead binary adder for a first and a second operand, said adder responsive to control signals for performing one of a plurality of logical operations and providing a corresponding set of result signals and including adder chips and a half-sum adder with look-ahead logic, an improved system for error detection comprising:

first logical means responsive to said first and said second operands for predicting parities for each byte of half-sums of said operands;

second logical means coupled to output terminals of said first means and to output terminals of said half-sum adder for comparing said predicted half-sum parities to parities of each byte of generated half-sums of said operands and for producing half-sum error signals corresponding to each byte when said predicted and said generated half-sum parities are unequal;

third logical means responsive to said control signals and coupled to said look-ahead logic for predicting parities for each byte of said result signals for said operands;

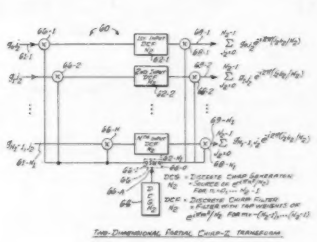
fourth logical means coupled to output terminals of said third means and to output terminals of said adder chips for comparing said predicted result signal parities to parities of each byte of generated result signals for said operands and for producing result error signals corresponding to each byte when said predicted and said generated result signal parities are unequal; and

fifth logical means coupled to said look-ahead logic and to output terminals of said adder chips for comparing carries generated by said look-ahead logic to output carries generated by said adder chips and for producing carry error signals when said carries are unequal.

3,925,648
APPARATUS FOR THE GENERATION OF A HIGH CAPACITY CHIRP-Z TRANSFORM

Jeffrey M. Speiser; Harper J. Whitehouse, and James M. Alsup, all of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 11, 1974, Ser. No. 487,849
Int. Cl.[2] G06F *15/34*; **G06G** *7/19*
U.S. Cl. 235—156 **2 Claims**



1. Apparatus for performing a high-capacity two-dimensional, chirp Z transform, in size N_1 times N_2, suitable for the signal processing of radar and sonar signals, comprising:

an N_2 plurality of two-dimensional partial chirp-Z transform devices, each transform device comprising:

a discrete chirp generator, which comprises a source of $e^{-\pi n^2/N2}$ signals, for $n = 0, 1, \ldots, N_2 - 1$;

a plurality of N_1 signal input multipliers, each receiving two inputs, one being of the N_1 columnar input transform values;

a single-pole double-throw (SPDT) switching means, having a switching pole connected to the discrete chirp generator. one fixed pole, the input pole, being connected to each of the N_1 input multipliers;

a plurality of N_1 input discrete chirp filters with tap weights of $e^{-i \quad m \ /N2}$, for $m = -(N_2-1), \ldots, (N_2-1)$, each filter having its input connected to the output of one of the N_1 input multipliers; and a plurality of N_1 signal output multipliers, each multiplier having one input connected to the output of one of the discrete chirp filters, the other input being connected to the other pole, the output pole, of the SPDT switching device, the N_1 outputs of the multipliers comprising

output signals

$$\sum_{j_2=0}^{N_2-1} R_{j1,j2}\, e^{-i2\pi(j_2 k_2/N_2)}; \text{ and}$$

an acoustic surface-wave demultiplexer and chirp multiplier, whose inputs comprise all the outputs of the partial transform devices;

an acoustic surface-wave discrete chirp filter, whose input comprises the output of the demultiplexer and chirp multiplier; and

an output multiplier whose two inputs comprise the output of the surface-wave discrete chirp filter and the output of the acoustic surface-wave discrete chirp generator, the output of the output multiplier comprising the terms of a one-dimensional chirp-Z transform in a linear congruential scan.

3,925,649
ELECTRONIC COMPUTER FOR THE STATIC RECOGNITION OF THE DIVISIBILITY, AND THE DIVISION OF, NUMBERS DIVISIBLE BY THREE, SIX AND NINE

Jochen Haeusler, Nurnberg-Laufamholz, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

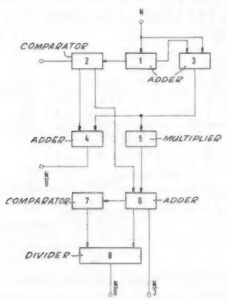
Filed Apr. 30, 1973, Ser. No. 355,595

Claims priority, application Germany, May 18, 1972, 2224329

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² G06F 7/39

U.S. Cl. 235—159 **6 Claims**



1. An electronic computer for the static recognition of the divisibility, and the division, of numbers N which are divisible by the integers 3, 6 and 9, comprising:

means for summing the digits of a dividend N;

means, coupled to said summing means, for indicating the divisibility of the sum of the dividend digits by the integers 3, 6 and 9;

means, coupled to said summing means, for determining an integer *n* which is nearest but less than the quotient of the dividend N divided by the integer 9, from both the carrys of the sum of the dividend digits and the dividend N;

means, coupled to said means for determining said integer *n* and to said indicating means, for determining the quotient of the dividend N divided by the integer 9;

means, coupled to said means for determining said integer *n*, for tripling said integer *n;*

means, coupled to said indicating means and said tripling means, for determining the quotient of the dividend N divided by the integer 3; and

means, coupled to said means for determining the quotient N/3, for determining the quotient of the dividend N divided by the integer 6.

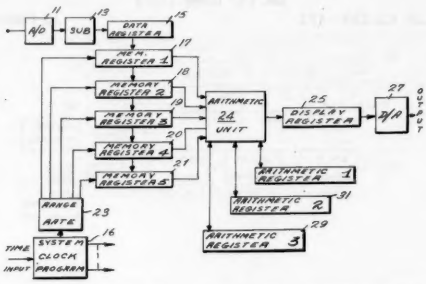
3,925,650
METHOD AND APPARATUS FOR DETECTING A REPETITIVE SIGNAL IN A NOISY BACKGROUND

Buck C. Brown, Rockville, Md., assignor to Presearch Incorporated, Silver Spring, Md.

Filed Feb. 15, 1974, Ser. No. 443,117

Int. Cl.² G06F 7/38

U.S. Cl. 235—164 **8 Claims**



1. An apparatus for detecting repetitive and similar input information signals in a noisy background wherein the information signals exist for only a short time relative to a complete repetitive interval and wherein the noise background exists for the complete repetition interval, comprising

means for generating a plurality of digital signals, one for each of a plurality of time increments in each repetition interval, said digital signals having a value corresponding to the amplitude of the input signal at each time increment,

means for subtracting the value of the digital signal in each time increment from the value of the digital signal in the next succeeding time interval to derive a plurality of difference signals,

means for sequentially storing each of said difference signals,

means for sequentially storing the difference signals of a plurality of said repetition intervals, and

means for summing the values of each of the difference signals in a predetermined time increment of each of said plurality of repetition intervals, wherein the difference signals in corresponding time intervals of said plurality of repetition intervals are summed to form a cumulative difference signal for the predetermined time increment over the plurality of repetition intervals.

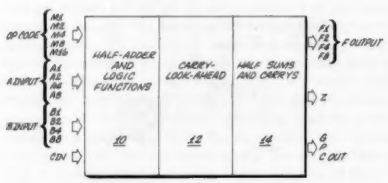
3,925,651
CURRENT MODE ARITHMETIC LOGIC ARRAY

Homer W. Miller, Peoria, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Mar. 26, 1975, Ser. No. 562,316

Int. Cl.² G06F 7/50

U.S. Cl. 235—175 **8 Claims**



1. A current mode arithmetic logic array comprising:

a first array portion for receiving a carry input, a binary operation code, and first and second binary signal inputs and producing half-sum of said inputs and carry generate output signals in response to said binary operation code,

a second array portion receiving said carry input, said half-sums and said carry generate signals and producing carry signals for each binary level of said first and second signals other than the least significant binary level, and

a third array portion responsive to said half-sum signals from said first portion, said carry signals from said second portion, and said operation code and producing a binary output resultant of the operation defined by said operation code on said first and second binary signals,

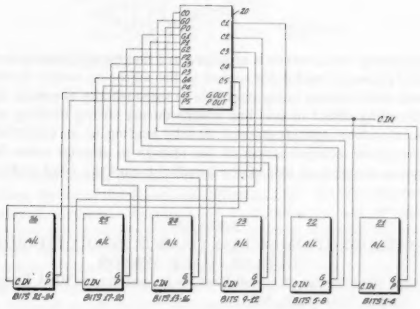
said first, second, and third portions comprising soft saturating current mode logic series gates including a lower level gate and an upper level gate having an output voltage range limited to approximately 0.5 volt.

3,925,652

CURRENT MODE CARRY LOOK-AHEAD ARRAY

Homer W. Miller, Peoria, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Mar. 26, 1975, Ser. No. 562,327
Int. Cl.[2] G06F *7/50*
U.S. Cl. 235—175 **7 Claims**



1. A current mode logic carry look-ahead array for use with up to six arithmetic/logic circuits, each arithmetic/logic circuit processing a limited number of bits of binary data in response to an operation code (**M1-M16**), a carry input (**C**), and input data (**A1-A8, B1-B8**), and producing output data (**F1-F8**) and carry generate (G_i) and carry propagate (P_i) signals, said carry look-ahead array comprising a plurality of logic circuits for receiving the carry generate (G_i) and carry propagate (P_i) signals from said arithmetic/logic circuits and the initial carry-in (C_{in}) signal and simultaneously producing carry signals for the arithmetic/logic circuits in accordance with the following equations:

$C1 = (G0)+(P0.C0)$

$C2 = (G1)+(P1.G0)+(P1.P0.C0)$

$C3 = (G2)+(P2.G1)+(P2.P1.G0)+(P2.P1.P0.C0)$

$C4 = (G3)+(P3.G2)+(P3.P2.G1)+(P3.P2.P1.G0)+(P3.P2.P1.P0.C0)$

$C5 = (G4)+(P4.G3)+(P4.P3.G2)+(P4.P3.P2.G1)+(P4.P3.P2.P1.G0)+(P4.P3.P2.P1.P0.C0)$

3,925,653

APPARATUS FOR TRANSFORMING ELECTRONICS SIGNALS BETWEEN THE TIME AND FREQUENCY DOMAINS UTILIZING ACOUSTIC WAVES

Oberdan W. Otto, Los Angeles, Calif., assignor to The Board of Trustees of Leland Stanford Jr. University, Stanford, Calif.

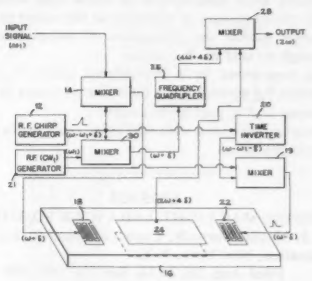
Filed Jan. 21, 1974, Ser. No. 434,965
Int. Cl.[2] G06G *7/19*; **H01L** *41/00*
U.S. Cl. 235—181 **4 Claims**

1. Apparatus for transforming an electronic signal between the time and frequency domain which comprises

means for generating a chirp signal,

means for mixing the electronic signal to be transformed with said chirp signal,

a piezoelectric medium,



transducer means for applying said mixed chirp and electronic signals to said piezoelectric medium to generate acoustic waves in a fashion such that parametric interaction occurs,

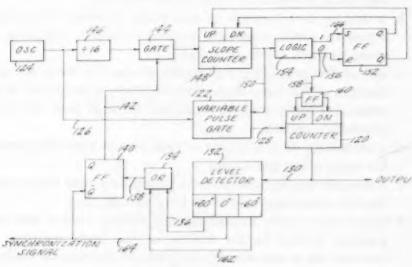
means for detecting the parametrically-interacted signals, and means for mixing the detected signal with said chirp signal.

3,925,654

DIGITAL SINE WAVE SYNTHESIZER

James P. Roantree, West Hartford, and John Saunders, East Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 13, 1974, Ser. No. 469,189
Int. Cl.[2] G06F *15/34*
U.S. Cl. 235—197 **3 Claims**



1. A digital sine wave synthesizer comprising

an oscillator for producing a series of timed pulses,

a variable pulse gate circuit connected to receive said series of oscillator pulses and to pass therethrough a variable proportion of said series of pulses,

a main counter connected with said variable pulse gate circuit for counting the pulses passed thereto by said variable pulse gate circuit,

a level detector connected to said main counter and responsive to a preselected count therein for producing a gating signal,

a divider circuit having an input connected to receive said oscillator pulses and to produce a series of output pulses equivalent to the number of oscillator pulses received at the input thereof divided by an integral number,

a gate circuit connected to receive the series of output pulses from said divider circuit,

a slope counter circuit connected to said gate circuit,

means for connecting said gating signal to said gate circuit to actuate said gate circuit and permit the passage of said

series of output pulses therethrough to said slope counter circuit, said slope counter circuit counting the pulses supplied thereto by said gate circuit,

means for connecting said slope counter circuit with said variable pulse gate circuit to cause said variable pulse gate circuit to vary in response to the count in said slope counter circuit the proportion of pulses passed therethrough to said main counter,

means responsive to a preselected count in said slope counter for reversing the direction of count in said slope counter and in said main counter,

and means connected with said main counter for producing an output signal.

3,925,655

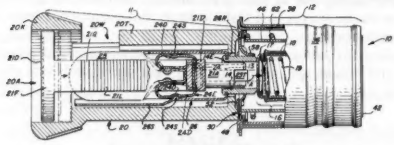
COMPOSITE MAP LIGHT AND CIGAR LIGHTER PLUG

Donald J. Mattis, Norwalk, Conn., assignor to Sun Chemical Corporation, New York, N.Y.

Filed Aug. 26, 1974, Ser. No. 500,370

Int. Cl.² F21V *33/00*

U.S. Cl. 240—2 CL **22 Claims**



1. A lighting assemblage for attachment to a contactor plug of the type receivable in electric cigar lighter wells and having electrical circuits, comprising in combination:

a. a hollow body member having separable-type mechanical and electrical connector means engageable with cooperable means on the contactor plug, for demountably attaching the body member on said plug and effecting an electrical connection to a circuit thereof,

b. a unitary lamp socket in said body member, comprising a pair of conductors and means insulatedly securing the same to each other as a unit,

c. means for providing a plurality of circuits from the conductors of the lamp socket respectively to a circuit on the contactor plug and to said mechanical and electrical connector means,

d. a switching device in one of said circuit-providing means for controlling the same,

d. manually-engageable means carried by said body member for operating said switching device, and

f. means removably mounting said unitary socket and conductors thereof in the hollow of the body member for removal as a unit therefrom without the use of tools, to facilitate replacement of the lamp.

3,925,656

PNEUMATIC CONTROL SYSTEM FOR SELF ALIGNMENT OF MOTOR VEHICLE HEADLIGHTS

Rudolf Andres, Sindelfingen; Hermann Möller, Aidlingen, and Franz Seyfried, Sindelfingen, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Apr. 27, 1973, Ser. No. 355,095

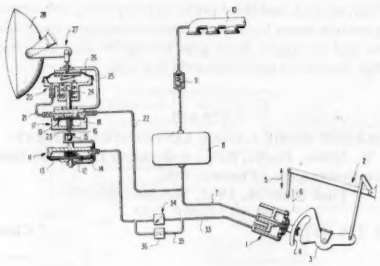
Claims priority, application Germany, Apr. 29, 1972, 2221320

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² B60Q *1/00*

U.S. Cl. 240—7.1 LJ **14 Claims**

1. A pneumatically operating control system for the automatic alignment of motor vehicle headlights which includes control means coordinated to at least one axle of the motor vehicle which align the motor vehicle headlights to a substantially constant light distance in dependence on the change of the distance of the respective axle to the body of the motor vehicle by way of adjusting motor means and control shifting means, a vacuum supply means operatively connected with the control system, and pressure modulator means forming part of the control means for modulating the vacuum pressure in the control system, characterized in that an automatically



operating valve means is arranged in a line means leading from said pressure modulator means to the adjusting motor means, said valve means being operable to substantially eliminate the throttling effect in said line means during strong braking and acceleration operations and thereby leading to an essentially immediate compensation of the change in angular value between the optical axis of the headlights and the road surface.

3,925,657

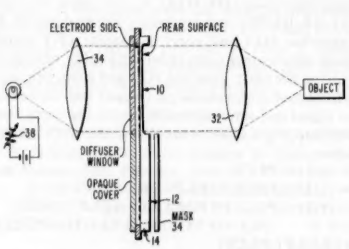
INTRODUCTION OF BIAS CHARGE INTO A CHARGE COUPLED IMAGE SENSOR

Peter Alan Levine, Kendall Park, N.J., assignor to RCA Corporation, New York, N.Y.

Filed June 21, 1974, Ser. No. 481,746

Int. Cl.² H01J *39/12*

U.S. Cl. 250—211 J **5 Claims**



1. A method for introducing a background charge signal into a surface channel charge coupled device image sensing array having a front surface at which the charge transfer electrodes are located and having also a back surface, which array receives a radiant energy image through one of said surfaces, comprising the step of:

applying radiant energy illumination at a bias level which is uniform over the entire area of the surface on which the radiant energy illumination at said bias level impinges, through the other of said surfaces, said entire area on which said radiant energy illumination at said bias level impinges including an area corresponding to substantially the entire area of said one surface receiving said radiant energy image.

3,925,658

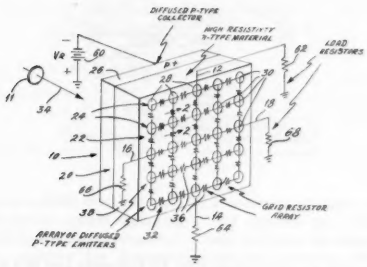
GRID LATERAL PHOTODETECTOR WITH GAIN

William P. Connors, Florissant, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 464,690, April 26, 1974, Pat. No. 3,859,521. This application Sept. 16, 1974, Ser. No. 506,228

Int. Cl.[2] H01J *39/12*

U.S. Cl. 250—211 J 19 Claims



1. A grid lateral photodetector comprising a wafer element formed by adjacent layers of different type semi-conductor materials forming a barrier layer therebetween, one of said adjacent layers forming a collector element adjacent to one surface of the device and a second of said layers forming a relatively high resistivity depletion region in said element, a plurality of spaced regions of a selected semi-conductor material formed on the wafer element opposite from the collector forming layer, each of said spaced regions and the adjacent portions of the wafer element forming a region in the element having current amplifying characteristics, current being generated in said element at each location where radiation impinges on the collector element, and means for producing outputs to represent the location where radiation impinges on the collector element including an array of angularly related connected resistive conductors on the surface of said element opposite from the collector element, currents produced in said element when radiation impinges flowing into the array of resistive conductors.

3,925,659

INELASTIC GAMMA RAY LOGGING SYSTEM

Hans J. Paap, and Hubert D. Scott, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Mar. 23, 1973, Ser. No. 344,304

Int. Cl. G01t *1/20*

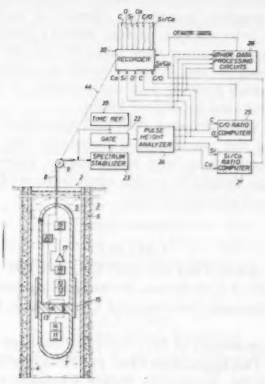
U.S. Cl. 250—270 10 Claims

1. Apparatus for determining the characteristics of material in the vicinity of a well borehole, comprising:

a fluid tight hollow body member sized for passage through a well borehole and having situated therein;

neutron source means for providing a flux of fast neutrons to irradiate materials in the vicinity of the borehole and liquid scintillation detector means comprising a scintillator material disposed in an essentially hydrogen free organic solvent for detecting gamma radiations attributable to the inelastic scattering of fast neutrons from materials in the vicinity of the borehole and for producing voltage pulses functionally related to the energy of the gamma radiations; and

means for separating said functionally related voltage pulses into a spectrum of corresponding inelastic gamma ray



energies and for recording said spectrum of inelastic gamma ray energies.

3,925,660

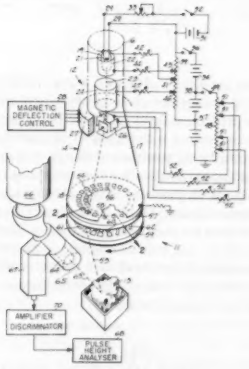
SELECTABLE WAVELENGTH X-RAY SOURCE, SPECTROMETER AND ASSAY METHOD

Richard D. Albert, 317 Hartford Road, Danville, Calif. 94523

Continuation-in-part of Ser. No. 251,378, May 8, 1972, abandoned. This application Apr. 24, 1973, Ser. No. 353,451

Int. Cl. G01n *23/20*

U.S. Cl. 250—272 18 Claims



1. In a method for analyzing the composition of a substance by X-ray fluorescence analysis, the steps comprising:

producing primary X-rays by directing charged particles to a selected one of a plurality of primary targets which are disposed at separate locations on a primary target plate and each of which has a different composition, the primary X-rays including a wavelength characteristic of the material of the selected primary target and further including a bremmstrahlung spectrum of many wavelengths,

directing said primary X-rays toward a selected one of a plurality of secondary targets which are disposed at separate locations on a secondary target carrier and each of which has a different composition whereby secondary X-rays are emitted from said selected secondary target,

said selected one of said secondary targets having a composition which emits characteristic X-rays having a wavelength spectra that produces X-ray fluorescence in a specific possible constituent element of said substance, and said selected one of said primary targets being of different composition than said selected one of said secondary targets and being selected to produce primary X-rays which promote said characteristic X-ray emission by said selected secondary target,

irradiating said substance with said secondary X-rays, and detecting the wavelength of characteristic fluorescent X-rays emitted by said substance in response to said irradiation thereof to enable identification of at least one constituent element thereof.

3,925,661

ANALYSIS OF MOVING FLUIDS

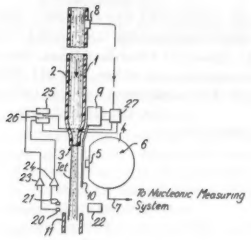
Kenneth Garfield Carr-Brion, Stevenage, England, assignor to National Research Development Corporation, London, England

Continuation-in-part of Ser. No. 292,786, Sept. 27, 1972, abandoned. This application Mar. 11, 1974, Ser. No. 450,233

Claims priority, application United Kingdom, Oct. 4, 1971, 46105/71; Germany, Oct. 3, 1972, 2248505

Int. Cl.² G01N *23/20*

U.S. Cl. 250—272 **10 Claims**



1. Apparatus for the analysis of a parameter of a moving fluid comprising means for passing said fluid through an orifice shaped to provide a fluid jet of defined dimensions; analyzing means comprising a detector of electromagnetic radiation, said detector being positioned in non-contacting proximity to said jet adjacent the orifice for receiving radiation travelling from said jet to produce a signal varying as a function of said parameter of said fluid; flow sensor means mounted adjacent said orifice for measuring the rate of flow of said fluid through said orifice; and means connected to said flow sensor means and operative to protect said detector should the rate of flow of said fluid fall below a predetermined value as indicated by said flow sensor means.

3,925,662

HIGH-RESOLUTION FOCUSSING DIPOLE MASS SPECTROMETER

Peter H. Dawson, Quebec, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed Mar. 25, 1974, Ser. No. 454,729

Claims priority, application Canada, July 20, 1973, 176936

Int. Cl.² B01D *59/44*

U.S. Cl. 250—290 **15 Claims**

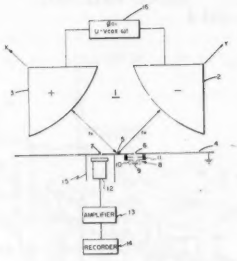
1. A mass analyser for focussing ions of a particular mass-to-charge ratio in an ion beam comprising:

a plane electrode;

parallel entrance and exit slits located in the plane electrode;

first and second elongated electrodes positioned in parallel to one side of the plane electrode such that the electrodes are symmetrically located with respect to a plane normal to the plane electrode and containing a centerline located between the slits;

a voltage source having a d.c. component and an rf component connected across the first and second electrodes to



provide an electrostatic field for focussing ions in a beam entering the field through the entrance slit such that ions of a particular mass-to-charge ratio will exit the field through the exit slit.

3,925,663

EXTENDED MONOPOLE SPECTROMETERS AND FILTERS

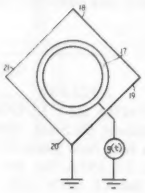
John Barry Hiller, Thornleigh; John Alan Richards, Townsville, and Richard Meredyth Huey, Sylvania, all of Australia, assignors to Unisearch Limited, Kensington, Australia

Filed June 28, 1973, Ser. No. 374,369

Claims priority, application Australia, June 28, 1972, 9497/72

Int. Cl.² H01J *39/34*

U.S. Cl. 250—292 **13 Claims**



1. A monopole mass spectrometer comprising:

an analyzing configuration consisting of a circular cylindrical electrode extending coaxially within a surrounding hollow square cylindrical electrode;

means for injecting ionized beams into said spectrometer between said circular cylindrical electrode and said square cylindrical electrode;

means for detecting said beams disposed opposite said injecting means; and

means for applying potential to both said circular cylindrical electrode and to said hollow square cylindrical electrode.

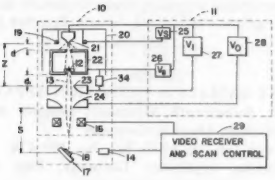
3,925,664
FIELD EMISSION ELECTRON GUN

Vincent J. Coates, Los Altos, and Leonard M. Welter, Saratoga, both of Calif., assignors to American Optical Corporation, Southbridge, Mass.

Division of Ser. No. 225,970, Feb. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 46,425, June 15, 1970, Pat. No. 3,678,333. This application Jan. 2, 1975, Ser. No. 537,879

Int. Cl.[2] H01J *37/285*

U.S. Cl. 250—310 **7 Claims**



1. In a field emission gun for a scanning charged particle microprobe system including a field emission gun a housing defining a vacuum chamber, a field emission tip disposed in said chamber for generating charged particles, electrode means including an intermediate electrode and a main electrode for establishing focusing and accelerating fields for forming a beam of said charged particles, voltage means connected to said electrode means and said field emission tip for supplying electrical potential to establish said focusing and accelerating fields and an extraction electrode connected to said voltage means in juxtaposition to said tip for developing an electric field for generating said charged particles, the improvement of a multi-element extraction electrode comprising a first member having an aperture centrally located and axially aligned with said beam, a second member having an aperture centrally located and axially aligned with said beam, said second member being interposed between said first member and said intermediate electrode and electrically connected to said first member, and means for spacing said first member and said second member forming a field free drift space in the region between said members.

3,925,665
THERMOLUMINESCENCE DOSIMETER READER

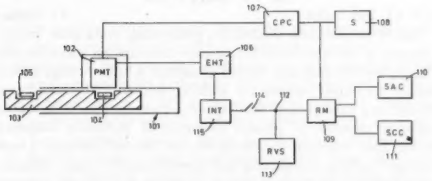
Malcolm Eric Alexander Robertson, Brookwood; John Marshall, Camberley; Jules Anthony Peter Brabants, Walton-on-Thames, and Michael Edward Davies, Maidenhead, all of England, assignors to D.A. Pitman Limited, Weybridge, England

Filed Aug. 14, 1974, Ser. No. 497,507

Claims priority, application United Kingdom, Aug. 17, 1973, 38989/73

Int. Cl.[2] G01T *1/11*

U.S. Cl. 250—337 **20 Claims**



1. A thermoluminescence dosimeter reader comprising an electric circuit arrangement including a photomultiplier tube for detecting thermoluminescence from a dosimeter, said photomultiplier tube having an input connected to a high voltage source and an output for producing an output current signal, and wherein there is provided a feedback loop from said output to said high voltage source; said feedback loop comprising converter means connected to said output to convert the output current signal of said photomultiplier tube into a pulse signal having a repetition frequency proportional to said output current signal; a rate meter connected to said converter and to which said pulse signal is supplied and which provides an output voltage proportional to the repetition frequency of said pulse signal; a reference voltage source connected to said rate meter; and an integrator connected to said rate meter and said reference voltage source, and to which the output voltage from said rate meter and a reference voltage from said reference voltage source are supplied, so as to produce a high voltage output signal from said integrator which output signal, when supplied to said high voltage source, acts to control the output of said high voltage source, whereby to provide automatic gain stabilisation for said tube.

3,925,666
GAS DETECTION SYSTEM

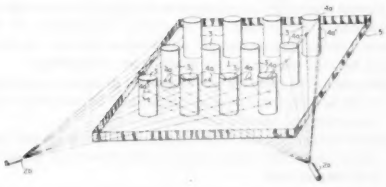
Colin J. Allan, and John G. Bayly, both of Deep River, Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Canada

Filed July 29, 1974, Ser. No. 492,458

Claims priority, application Canada, Nov. 14, 1973, 185825

Int. Cl.[2] G01D *21/04*; **G01J** *1/00*; **G01N** *21/34*; **G08B** *21/00*

U.S. Cl. 250—338 **6 Claims**



1. An apparatus for monitoring a known gas in the atmosphere around a plant area comprising:

a. a first number of reflector means mounted in a spaced manner in the plant area;

b. first detector means positioned at a first predetermined location in direct line of sight with each first reflector means, the first detector means including:

i. light source means providing a collimated beam having at least a wavelength which corresponds to an absorption line of the gas;

ii. means for cyclically directing the beam onto each first reflector means at a first scan rate; and

iii. means for receiving the reflected beam indicating the presence of the gas in the beam path as a function of any absorption of the corresponding wavelength;

c. a second number of reflector means mounted in a spaced manner in the plant area; and

d. second detector means positioned at a second predetermined location in direct line of sight with each second reflector means such that the lines of sight between the second detector means and the second reflector means overlap with the lines of sight between the first detector means and the first reflectors means to form a grid, the second detector means including:

i. light source means providing a collimated beam having at least a wavelength which corresponds to an absorption line of the gas;

ii. means for cyclically directing the beam onto each second reflector means at a second scan rate; and

iii. means for receiving the reflected beam indicating the presence of the gas in the beam path as a function of any absorption of the corresponding wavelength.

3,925,667

TWO BEAM INFRARED GAS ANALYZER

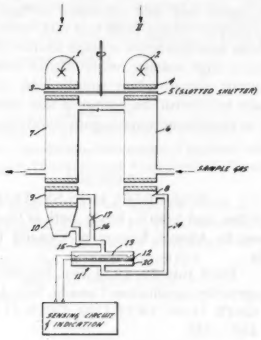
Joachim Staab, Frankfurt am Main, Germany, assignor to Hartmann & Braun Aktiengesellschaft, Frankfurt, Germany

Filed Oct. 17, 1974, Ser. No. 515,518

Claims priority, application Germany, Oct. 20, 1973, 2352813

Int. Cl.[2] G01N 21/36

U.S. Cl. 250—343 7 Claims



5. A detector for use in an infrared gas analyzer, the analyzer having means for providing two radiation beams which are periodically intercepted for intensity modulation of both beams, further having sample cell means disposed to be traversed by said two beams as modulated, comprising:

first and second absorbtion chambers disposed respectively to be serially traversed by one of said beams after having traversed the sample cell means;

a third absorbtion chamber disposed to be traversed by the other one of the beams after having traversed the sample cell means; and

a chamber with partitioning diaphragm being part of a sensing capacitor for connection to an electrical sensing circuit and connected with one side to the second chamber as receiving radiation from the first chamber due to optically serial relationship between the first and second chambers, the chamber with diaphragm having its other side connected to the third chamber so that the diaphragm is deflected upon pressure differences between the second and third chambers.

3,925,668

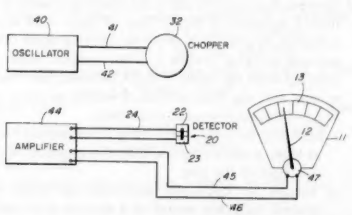
SPECTRAL SENSOR AND METHOD

Norman C. Anderson, Morris Island, Chatham, and Robert E. Rupert, South Dennis, both of Mass., assignors to F-S Inc., South Dennis, Mass.

Filed Mar. 25, 1974, Ser. No. 454,318

Int. Cl.[2] G01J 1/04

U.S. Cl. 250—351 2 Claims



1. A radiation sensor for detecting and indicating temperature responsive radiation comprising a radiation sensitive detector means enclosed within a case and adapted to generate an electric response to radiation, an aperture associated with said detector means and positioned to admit radiation and to direct radiation to said detector, a flexible shield positioned between said aperture and said detector, said shield having a mechanically resonant frequency of vibration and being so positioned that it is adapted to vibrate into and out of a shielding position in which is interrupts radiation from said aperture, means to generate a periodically varying electric signal at said resonant frequency, means responsive to said signal to flex said shield whereby said shield is caused to vibrate at a resonant frequency, and means responsive to electric output of said detector means to denote the presence of activating radiation impinging on said detector means.

3,925,669

STRIPLINE RADIATION DETECTION APPARATUS

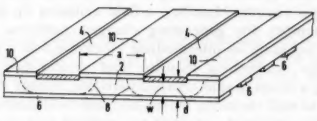
Peter Glasow, Bubenreuth, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed July 18, 1973, Ser. No. 380,470

Claims priority, application Germany, Aug. 14, 1972, 2239953

Int. Cl. G01t 1/24

U.S. Cl. 250—370 10 Claims



1. An apparatus for detecting ionizing radiation, comprising:

a planar sheet of semiconductor material; and

a plurality of stripline electrodes disposed on opposite planar surfaces of said sheet and offset from each other by a predetermined angle, said electrodes on one of said sheet surfaces being spaced apart by a distance which is at least equal to twice the thickness of the sheet of semiconductor material and said electrodes on both of said surfaces in combination, the length of said sheet and said semiconductor material being chosen so as to provide a predetermined electrical resistance which, in response to a selected voltage applied to said electrodes, creates a field zone of a depth equal approximately to the distance between oppositely disposed electrodes at their planar crosswise points of intersection.

3,925,670

ELECTRON BEAM IRRADIATION OF MATERIALS USING RAPIDLY PULSED COLD CATHODES

Sherman R. Farrell, Orinda, and Gary K. Loda, Danville, both of Calif., assignors to Systems, Science and Software, La Jolla, Calif.

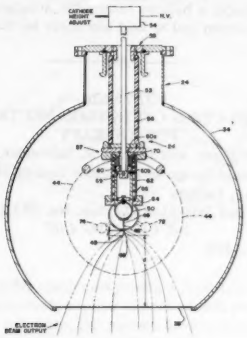
Filed Jan. 16, 1974, Ser. No. 433,866

Int. Cl.[2] H01J 37/00

U.S. Cl. 250—400 11 Claims

10. In an electron irradiation processing apparatus, means forming a vacuum chamber, means forming an electron discharge device disposed in said chamber, a high voltage power supply including means for pulsing said electron discharge device at a rate greater than about 1 pulse per second, a cold cathode capable of plasma emission of electrons disposed within said electron discharge device, means forming a high voltage bushing connecting said power supply to said cathode, said cathode including means forming a cathode housing having a generally elongate cylindrical configuration said housing having an elongate slit therein, means forming an elongate electron emissive edge projecting through said slit and directed toward a predetermined location, and means for adjusting the position of said edge relative to said housing;

means forming an anode along the area at said location, means connecting said anode to said power supply, whereby electrons are caused to be emitted from said cathode as extended



streams along the length of said cathode and splayed over the area of said anode without scanning, and means for passing a material to be treated through said predetermined location.

3,925,671

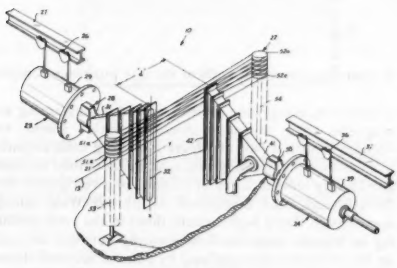
IRRADIATING STRAND MATERIAL

James Raymond Austin, Williamsville, N.Y.; Martin John Brown, Lambertville, and Leonard Donald Loan, New Providence, both of N.J., assignors to Bell Telephone Laboratories, Incorporated and Western Electric Company, Inc., both of New York, N.Y.

Continuation of Ser. No. 304,458, Nov. 7, 1972, abandoned. This application Sept. 19, 1974, Ser. No. 507,500

Int. Cl.[2] A61N *5/00;* **A61K** *27/02;* **C08F** *2/46*

U.S. Cl. 250—400 **8 Claims**



1. A method of irradiation cross-linking the insulation of a plurality of conductors, which includes the steps of:

directing a first electron radiation beam toward and into engagement with a plurality of conductors each of which is strung up in a path between spaced conductor engagement surfaces which includes a plurality of repetitive superimposed spaced apart layers, each of the layers having a figure eight configuration, the beam being directed through a window toward a corresponding portion of one loop of each of the layers; while

directing a second electron radiation beam through a window toward the path and into engagement with a corresponding portion of the other loop of each of the layers without overlapping the first beam in the vicinity of the layers, the windows being spaced from the conductors a distance substantially greater than the external diameter of the insulated conductor, the beams being oriented with respect to the superimposed adjacent layers such that each layer is exposed to substantially the same radiation dose; and

advancing the conductors along each of the layers to expose sequentially different rotational orientations of the insulation to the first and to the second electron beams thereby causing perturbation of the angle of incidence of the beams on the conductors to uniformly dose the insulation thereof substantially by exposure to direct radiation from the first and second electron radiation beams.

3,925,672

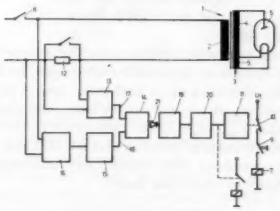
X-RAY DIAGNOSIS APPARATUS WITH A DIRECTLY HEATED X-RAY TUBE

Eickhardt Soder, Uttenreuth, and Ulrich Grassme, Nurnberg, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Continuation-in-part of Ser. No. 313,094, Dec. 6, 1972, abandoned. This application May 10, 1974, Ser. No. 468,640

Int. Cl.[2] H05G *1/10*

U.S. Cl. 250—402 **5 Claims**



1. An X-ray diagnosis apparatus, comprising an X-ray tube of the directly heated type having a filament, a high-voltage transformer connected to a line and having a first secondary winding, connected to the anode and the cathode of the X-ray tube and a second secondary winding connected to said filament, a time switch, and a blocking circuit connected with said time switch and said transformer for releasing said time switch when the anode current of said X-ray tube has reached a predetermined value after the X-ray tube is switched on, said blocking circuit having means for detecting the change in phase displacement between the primary current of said transformer and the line voltage during a rise in the current of the X-ray tube.

3,925,673

APPARATUS FOR GENERATING HEAVY OXYGEN MOLECULES

Joseph E. Wright, Jr., 1119 E. Prairie Ave., Wheaton, Ill. 60187

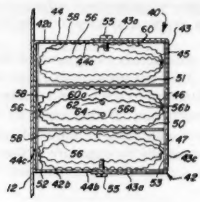
Continuation of Ser. No. 340,296, March 12, 1973, abandoned. This application July 11, 1974, Ser. No. 487,644

Int. Cl.[2] H01J *37/00*

U.S. Cl. 250—432 **11 Claims**

1. Air purification apparatus comprising: a plurality of electrode elements each comprised of a flattened tubular spiral of metal wire mesh wound so as to define effectively an inner tube coaxially within an outer tube and so that the inner tube is of substantially the same width as said outer tube; means for retaining said electrode elements in a side-by-side array with the tubes thereof generally aligned and parallel;

dielectric means for effecting an insulating separation between adjacent electrode elements of said array; and means



for establishing an electric discharge between adjacent ones of said elements.

3,925,674

X-RAY IMAGE INTENSIFIER PHOSPHOR

Arthur P. D'Silva, and Velmer A. Fassel, both of Ames, Iowa, assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Jan. 30, 1973, Ser. No. 327,899

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] G01D *15/14*

U.S. Cl. 250—483 **1 Claim**

1. An X-ray intensifier screen including a base transparent to X-ray but opaque to ultraviolet-visible light; an X-ray excitable phosphor disposed upon said base, said X-ray excitable phosphor emitting ultraviolet-visible light, said phosphor having the formula $Y_{1-x}Gd_xPO_4{:}Tb^{+3}$ where $x = 0.3$ to 0.1 and the terbium concentration is between about 0.008 and 0.012 mole per mole of phosphate, and a binder for retaining said X-ray excitable phosphor upon said base.

3,925,675

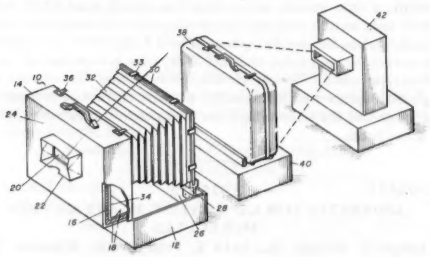
PORTABLE FLUOROSCOPE

Imants Gulbis, Reston, Va., and Rodney W. Jordan, Newton, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 6, 1974, Ser. No. 504,000

Int. Cl.[2] G01N *21/52*

U.S. Cl. 250—485 **1 Claim**



1. A portable fluoroscope for inspecting the contents of closed packages which comprises:

housing means for carrying said fluoroscope to an inspection site, having a radiation shielding top cover section hingedly attached to a radiation shielding bottom section wherein said housing means includes a suitcase;

sensing means, hingedly positioned on said bottom cover section, for producing an image of the contents of said packages, wherein said sensing means includes a fluorescent screen;

a lead-glass eyepiece centrally positioned in said top cover section for viewing said sensing means; and

means for excluding light from said sensing means to enable an observer peering through said eyepiece to clearly discern the contents of said closed packages, as imaged on said sensing means, wherein said means for excluding light includes a bellows removably attached to said fluorescent screen and to said top cover section.

3,925,676

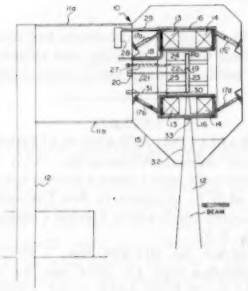
SUPERCONDUCTING CYCLOTRON NEUTRON SOURCE FOR THERAPY

Clifford B. Bigham, and Harvey R. Schneider, both of Deep River, Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Canada

Filed July 31, 1974, Ser. No. 493,415

Int. Cl.[2] G21G *4/02*

U.S. Cl. 250—499 **6 Claims**



1. A neutron source for medical therapy purposes comprising:

a. a cyclotron comprising an iron metal housing acting as a magnetic yoke, magnetic shield, radiation shield, and vacuum vessel, a pair of superconducting coils mounted in a cavity in the housing said coils being cooled to superconducting temperatures by passage of a refrigerant fluid therethrough and connected to an electrical energy source such that a high current flows in the coils producing an intense magnetic field inwardly between the coils, an ion orbiting region defined by pairs of sectoral-shaped RF electrode structures energized at an Rf frequency and focussing flutter poles mounted in the intense magnetic field between coils, a source of ions positioned centrally of the ion orbiting region to provide a stream of ions that will be orbited in the orbit region;

b. an ion target positioned internally of said iron housing at an outer position in the orbit region such that orbiting ions strike the target and produce neutrons;

c. a channel formed in the iron housing from the target to the exterior for passage of the beam of neutrons formed at the target, said channel acting as a beam collimator; and

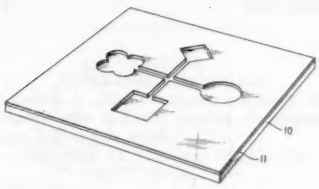
d. a mounting structure for movably mounting the cyclotron and target such that the neutron beam produced can be employed at more than one position.

3,925,677

PLATINUM OXIDE LITHOGRAPHIC MASKS

David Bruce Fraser, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 15, 1974, Ser. No. 460,756
Int. Cl.² G21F 5/04
U.S. Cl. 250—505 4 Claims



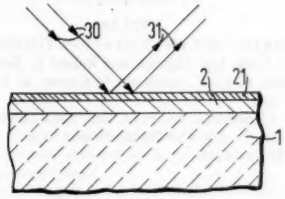
3. A lithographic mask comprising a rigid transparent substrate, and a selectively applied pattern of thin platinum oxide formed on the substrate, the pattern having microscopic features suitable for microcircuit lithography.

3,925,678

ABSORPTION LAYER FOR USE DURING X-RAY FLUORESCENCE ANALYSIS WHICH PREVENTS HARD X-RAYS

Otto Eberspaecher, and Herman Pfisterer, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 12, 1974, Ser. No. 488,076
Claims priority, application Germany, July 18, 1973, 2336652
Int. Cl.² H01J 35/16
U.S. Cl. 250—508 6 Claims



1. A layered structure for x-ray absorption formed on and covering a base member comprising a first layer of high-purity aluminum formed on said base member, and a second layer of high-purity anodic oxidized aluminum formed on said first layer.

3,925,679

MODULAR OPERATING CENTERS AND METHODS OF BUILDING SAME FOR USE IN ELECTRIC POWER GENERATING PLANTS AND OTHER INDUSTRIAL AND COMMERCIAL PLANTS, PROCESSES AND SYSTEMS

Paul A. Berman, Plymouth Meeting; Theodore C. Giras, Pittsburgh, and Roy E. Crews, Allison Park, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 21, 1973, Ser. No. 399,582
Int. Cl.² B65D 85/00
U.S. Cl. 290—1 36 Claims

1. A method of building an operating center for a plant designed to produce goods or services, the steps of said method comprising:

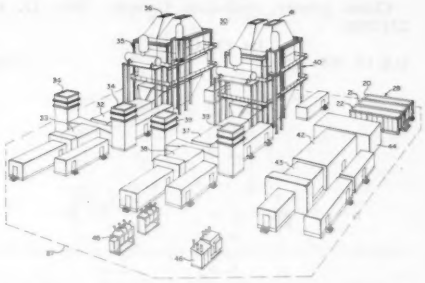
loading each of a plurality of transportable room-size building modules with predetermined electrical control system equipment units at a factory site, such building modules constituting structural parts of a unitary operating center building and such control system equipment units constituting parts of a system for use in monitoring and/or controlling the operation of the production plant;

establishing at the factory site predetermined intramodule connections among the control equipment units within each building module;

establishing at the factory site predetermined intermodule connections among the control system equipment units in different ones of the building modules;

establishing at the factory site predetermined connections to the control system equipment units for ultimate attachment from one or more of the modules to the production plant at predetermined plant points;

employing a plurality of conductors to establish the intramodule connections;



employing a plurality of cables having a plurality of conductors to establish the intermodule and plant connections through cable connection points;

testing the control system equipment at the factory site, such testing including the combined testing of the control system equipment interconnected by the intermodule cable connections;

preparing the loaded building modules for transportation to the plant installation site including disconnecting the intermodule and any test connections at the cable connection points;

transporting the modules to the plant site;

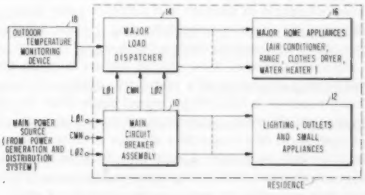
and installing the modules and establishing the cable connections from the modules to the plant points and reestablishing the intermodules cable connection.

3,925,680

METHOD AND SYSTEM FOR REGULATING PEAK RESIDENTIAL POWER DEMAND

William A. Dixon, 132 Stewart St., St. Simons Island, Ga. 31522

Filed Apr. 4, 1975, Ser. No. 565,224
Int. Cl.² H02J 13/00
U.S. Cl. 307—39 12 Claims



5. Apparatus for regulating peak power demands of major residential appliances including air conditioning and food preparation devices of residential users in an electrical power distribution system connected to a residence comprising:

means for monitoring the temperature outside the residence related to the peak power demands; and,

means for supplying electrical power to the devices in response to the monitored temperature exceeding a predetermined value, said supplying means including:

means for detecting requirements for electrical power for at least some of the devices; and,

means for supplying electrical power to one of the devices requiring power to the exclusion of at least one of the others irrespective of a requirement for power of said at least one of the others.

3,925,681

MONITORING, COUNTING AND SAFETY APPARATUS

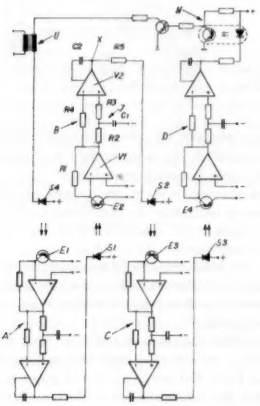
Hans-Dieter Grudelbach, Seestrasse 10, Plon, Germany

Filed Mar. 11, 1974, Ser. No. 450,221

Claims priority, application Germany, Mar. 13, 1973, 2312375

Int. Cl.² G01D 21/04

U.S. Cl. 307—117 4 Claims



1. Detecting apparatus comprising a plurality of emitters which are capable of emitting a signal beam across a space to be subject to surveillance, a receiver connected to and adapted to control each respective emitter, each pair of connected emitters and receivers forming a separate channel, the respective channels of emitter and receiver pairs being physically located to form a complete ring circuit wherein the receiver of one channel receives a beam signal from an emitter of an adjacent channel, first circuit means in each channel adapted to stop operation of a respective emitter as long as its respective receiver is receiving a signal beam from the emitter of the adjacent channel, second circuit means in each channel to start operation of a respective emitter as long as its respective receiver fails to receive a signal beam from the emitter of the adjacent channel, and interpreting means connected in the channel ring operable in response to change of state of the circuit for interpreting by signal the state of the circuit, the number of channels of said ring circuit being selected to produce the most desirable natural frequency of oscillation of the circuit when in operation.

3,925,682

CHATTERING IMMUNE CIRCUIT

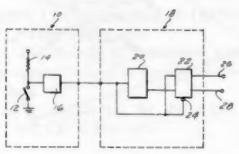
Kenji Hamada, Yokohama, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Feb. 25, 1974, Ser. No. 445,355

Claims priority, application Japan, Mar. 26, 1973, 48-34292

Int. Cl.² H03B 1/00, 1/04

U.S. Cl. 307—134 10 Claims



1. A chattering immune circuit for use with means for generating a control signal having chattering components present therein for a pre-determined period subsequent to the initiation thereof, said circuit comprising a monostable multivibrator, said monostable multivibrator being operably connected to said control signal generator means and effective to generate an intermediate signal upon the detection of the rising edge portion of said chattering components and for a given time thereafter, said given time being at least as long as said pre-determined time, and means operatively connected to said monostable multivibrator for generating an output signal comprising means for causing said output signal to commence at a time determined by the termination of said intermediate signal and means for causing said output signal to terminate simultaneously with the termination of said control signal.

3,925,683

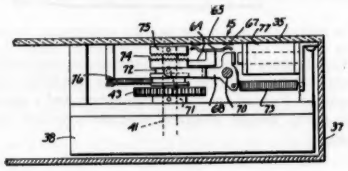
AUTOMATIC MULTIPLE STATION TIMING SYSTEM

Gustav A. Link, Los Angeles, and Robert E. Boyden, Temple City, both of Calif., assignors to Gustav A. Link, Los Angeles, Calif.

Filed Dec. 13, 1973, Ser. No. 424,196

Int. Cl.² H01H 7/00, 43/00

U.S. Cl. 307—141 9 Claims



1. A multiple station timing system comprising

a station device movable to different stations,

a first motor for moving said station device,

a continuous operable clock motor,

start means controlled by said clock motor for energizing said first motor at a selected time,

means responsive to said station device upon reaching one of said stations for deenergizing said first motor,

a control device movable through a predetermined path by said clock motor,

time duration control means for determining the duration of time said station device is at different ones of said stations,

said duration control means including elements spaced along the path of said control device,

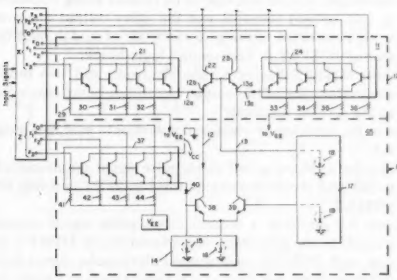
means for conditioning selected ones of said elements,
means responsive to engagement of said control device with a conditioned one of said elements for reenergizing said first motor,
means normally maintaining said control device in a home position spaced from said elements, and
means responsive to movement of said station device to one of said stations for causing said clock motor to drive said control device from said home position through said path.

3,925,684

UNIVERSAL LOGIC GATE

James R. Gaskill, Jr., Pacific Palisades, and Don C. Devendorf, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 11, 1974, Ser. No. 450,114
Int. Cl.² H03K *19/08*
U.S. Cl. 307—203 **10 Claims**



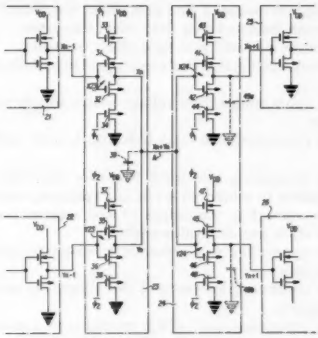
1. A universal logic gate for synthesizing logic functions having a plurality of cascode circuits and a plurality of load circuits having input and output terminals, each of said cascode circuits comprising:
an upper current switch section having first, second, third and fourth current paths; a lower current switch section having first and second main current paths, said first and second current paths of said upper current switch section being coupled to said first main current path, said third and fourth current switch paths of said upper current section being coupled to said second main current switch path;
a current switch source being coupled to said first and second main current paths;
first switching means having a plurality of input terminals for controlling the flow of said switch current in said first and second main current paths;
second switching means having a plurality of input terminals for controlling the flow of switch current in said first and second current paths of said upper current switch sections;
third switching means having a plurality of input terminals for controlling the flow of current in said third and fourth current switch paths of said upper current switch section;
selected ones of said upper current switch paths being coupled to said input terminals of selected ones of said plurality of load circuits; and
selected output terminals of selected other ones of said plurality of load cells being coupled together.

3,925,685

TIME SHARING INFORMATION CIRCUIT

Yasoji Suzuki, Kawasaki, Japan, assignor to Tokyo Shibaura Electric Company, Ltd., Tokyo, Japan

Filed Apr. 30, 1973, Ser. No. 355,876
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² H03K *17/00*
U.S. Cl. 307—205 **11 Claims**



1. A time sharing information transmission circuit comprising,
a time sharing circuit having two inputs and an output,
a restoring circuit having one input and two outputs,
a transmission line connected between the output of said time sharing circuit and the input of said restoring circuit, said time sharing circuit comprising,
a first insulated gate field effect transistor,
a second insulated gate field effect transistor,
a third insulated gate field effect transistor,
a fourth insulated gate field effect transistor,
a fifth insulated gate field effect transistor,
a sixth insulated gate field effect transistor,
a seventh insulated gate field transistor,
an eighth insulated gate field effect transistor,
means connecting a first clock signal to said first transistor,
means connecting a first voltage source to said first transistor,
means connecting said first transistor to said second transistor,
means connecting said second transistor to said third transistor,
means connecting a first information signal to said second and third transistors,
means connecting said third transistor to said fourth transistor,
means connecting a second clock signal to said fourth transistor,
means connecting said fourth transistor to a fifth voltage source,
means connecting a third clock signal to said fifth transistor,
means connecting a second voltage source to said fifth transistor,
means connecting said fifth transistor to said sixth transistor,
means connecting said sixth transistor to said seventh transistor,
means connecting a second information signal to said sixth and seventh transistors,
means connecting said seventh transistor to said eighth transistors,
means connecting a fourth clock signal to said eighth transistor,

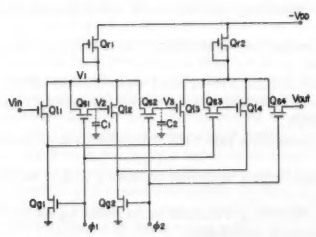
means connecting connecting said eighth transistor to a sixth voltage source,
means connecting said second and third transistors to said input of said transmission line,
means connecting said sixth and seventh transistors to said input of said transmission line,
said restoring circuit comprising,
a ninth insulated gate field effect transistor,
a tenth insulated gate field effect transistor,
an eleventh insulated gate field effect transistor,
a twelfth insulted gate field effect transistor,
a thirteenth insulated gate field effect transistor,
a fourteenth insulated gate field effect transistor,
a fifteenth insulated gate field effect transistor,
a sixteenth insulated gate field effect transistor,
means connecting said first clock signal to said ninth transistor,
means connecting a third voltage source to said ninth transistor,
means connecting said ninth transistor to said tenth transistor,
means connecting said tenth transistor and said eleventh transistor to a first output of said restoring circuit,
means connecting the output of said transmission line to said tenth and eleventh transistors,
means connecting said eleventh transistor to said twelfth transistor,
means connecting said second clock signal to said twelfth transistor,
means connecting said twelfth transistor to a seventh voltage source,
means connecting said third clock signal to said thirteenth transistor,
means connecting a fourth voltage source to said thirteenth transistor,
means connecting said thirteenth transistor to said fourteenth transistor,
means connecting said fourteenth transistor and said fifteenth transistor to a second output of said restoring circuit,
means connecting the output of said transmission line to said fourteenth and fifteenth transistors,
means connecting said fifteenth transistor to said sixteenth transistor,
means connecting said fourth clock signal to said sixteenth transistor,
means connecting said sixteenth transistor to an eighth voltage source.

3,925,686

LOGIC CIRCUIT HAVING COMMON LOAD ELEMENT

Kosei Nomiya, Tokyo, Japan, assignor to Hitachi, Ltd., Japan

Filed Nov. 6, 1973, Ser. No. 413,322
Claims priority, application Japan, Nov. 6, 1972, 47-110319
Int. Cl.[2] H03K *19/08, 19/34, 19/22;* **G11C** *19/28*
U.S. Cl. 307—205 **2 Claims**



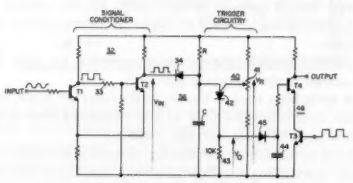
1. A logic circuit having first and second clock controlled logic stages, each logic stage comprising:
a depletion type load MISFET having a drain electrode connected to a first terminal, a source electrode connected to a second terminal and a gate electrode connected to said second terminal;
a first logic block connected between said second terminal and a third terminal, said first logic block comprising at least one first MISFET having a gate electrode, a drain electrode electrically connected to said second terminal and a source electrode electrically connected to said third terminal;
a second logic block connected between said second terminal and a fourth terminal, said second logic block comprising at least one second MISFET having a gate electrode, a drain electrode electrically connected to said second terminal and a source electrode electrically connected to said fourth terminal;
said depletion load MISFET acting as a common load for the transistors in said first and second logic blocks;
a third MISFET having a gate electrode, a drain electrode connected to said third terminal and a source electrode connected to a ground terminal;
a fourth MISFET having a gate electrode, a drain electrode connected to said fourth terminal and a source electrode connected to the ground terminal;
a fifth MISFET having a gate electrode and two output electrodes, one of said output electrodes being connected to said second terminal and the other output electrode being connected to the gate electrode of said at least one second MISFET in said second logic block;
a sixth MISFET having a gate electrode and two output electrodes, one of the output electrodes being connected to the second terminal;
means for applying an electrical potential to said first terminal;
means for applying a first clock pulse signal simultaneously to the gate electrodes of said third MISFET and said fifth MISFET;
means for applying a second clock pulse signal simultaneously to the gate electrodes of said fourth MISFET and said sixth MISFET, said second clock pulse signal being different from said first clock pulse signal in phase; and
means for applying an input signal to the gate electrode of said first MISFET, wherein said third and fourth MISFETs, respectively, of said first logic stage are the third and fourth MISFETs of said second logic stage.

3,925,687

GATED FILTER CIRCUIT

Elias E. Solomon, Duxbury, Mass., assignor to Gulf & Western Manufacturing Company (Systems), New York, N.Y.

Filed July 19, 1973, Ser. No. 380,583
Int. Cl.[2] H03D *13/00;* **H03K** *5/20;* **H03D** *3/00*
U.S. Cl. 307—233 R **11 Claims**



1. A filter circuit comprising;
means for receiving an alternating signal,
a free-running oscillator circuit including a capacitance means and means defining a reference level to which the capacitance means is chargeable,
means coupled from said receiving means to said capacitance means for controlling operation of said oscillator to clamp said capacitance means and inhibit charging

thereof during a portion of the period of the alternating signal and to unclamp said capacitance means and enable charging thereof during the remainder of the period of the alternating signal,

and means coupled from said free-running oscillator for providing an output signal when the period of the alternating signal is greater than a predetermined period corresponding to a predetermined cut-off frequency, the frequency of the output signal when occuring being proportional to the frequency of the alternating signal,

wherein said means for providing an output signal includes output circuit means and means for coupling a gating signal to said output circuit means.

3,925,688

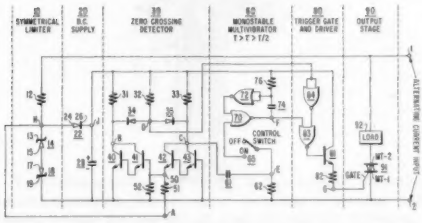
INTEGRAL CYCLE ZERO-VOLTAGE SWITCHING CIRCUITS

Martin Aaron Kalfus, Morganville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 29, 1975, Ser. No. 545,158

Int. Cl.[2] H03K *17/72*

U.S. Cl. 307—252 B **9 Claims**



1. In a system which includes first and second terminals for receiving an alternating current signal of period T thereacross, a load connected between the first terminal and a third terminal, and the main conduction path of a gate controlled switch connected between the second and third terminals, a circuit for insuring that the switch, when closed, will be closed for an integral number of periods T, the circuit comprising, in combination:

first means responsive to said alternating current signal for producing a control signal at a first level for a period between T/2 and T beginning at an axis crossing of a given sense of said alternating current signal and at a second level for the remainder of the period;

second means responsive to the potential of a selected one of the first and third terminals for producing a trigger signal at each axis crossing thereof;

third means responsive to the control signal and to the trigger signals for applying the trigger signals to a gate electrode of the switch solely when the control signal is at the first level; and

fourth means for initiating and terminating the control signal, in each case solely when the latter is at its second level.

3,925,689

HIGH SPEED DATA BUFFER AND AMPLIFIER

Richard B. Rubenstein, New York, N.Y., assignor to General Instrument Corporation, Clifton, N.J.

Filed Sept. 13, 1974, Ser. No. 505,560

Int. Cl.[2] H03K *5/02*

U.S. Cl. 307—260 **2 Claims**

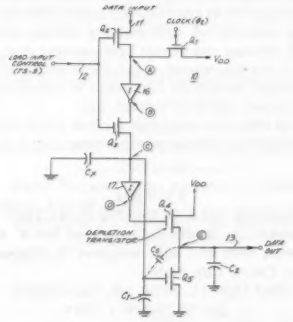
1. A high-speed data buffer and amplifier, which comprises:

first (Q_2) and second Q_3) serially-connected transistors, the data signal to be amplified being connected to the source electrode of said first transistor;

a first inverter (**16**) interposed between the drain electrode of said first transistor and the source electrode of said second transistor;

means (Q_1, VDD, $\phi 2$), connected to the input of said first inverter, for supplying clock pulses of a first phase ($\phi 2$) from an external source to the input of said first inverter to pre-charge the same;

means (**12**), connected to the gate electrode of said first and second transistors, for supplying a control pulse (CTS-3) from an external source, said pulse being of opposite phase to said clock pulse and gating said first and second transistors into conduction;



third (Q_4) and fourth (Q_5) transistors serially connected between a supply potential and ground, the output (**13**) of said buffer being connected to the juncture of the drain electrode of said third transistor and the source electrode of said fourth transistor; and

a second inverter (**17**) connected between the drain electrode of said second transistor and the gate electrode of said third transistor, the gate electrode of said fourth transistor being connected to the input of said second inverter.

3,925,690

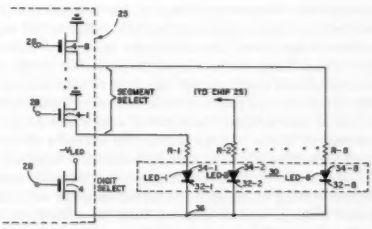
DIRECT DRIVE CIRCUIT FOR LIGHT EMITTING DIODES

John R. Spence, Villa Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sept. 30, 1974, Ser. No. 510,254

Int. Cl.[2] H03K *1/02*; **H05B** *39/04*, *39/02*; **H03K** *3/42*

U.S. Cl. 307—270 **14 Claims**



8. A driver circuit to drive a plurality of light emitting diodes, each having first and second terminals thereof, comprising

a first three electrode transistor means including a control electrode and two electrodes having a conduction path formed therebetween,

one of said first transistor means conduction path electrodes connected at a common point to the first terminal of each of said plurality of light emitting diodes,

a supply of voltage subject to variation applied to the other of said conduction path electrodes of said first transistor means,

a constant supply of voltage applied to the control electrode of said first transistor means,

a plurality of second three electrode transistor means, each of said second transistor means including a control electrode and two electrodes having a conduction path formed therebetween, each of said conduction paths to be selectively connected to the second terminal of a respective light-emitting diode so as to comprise current regulating paths to continuously control the drive current to said plurality of light-emitting diodes and simultaneously activate any of said light-emitting diodes according to a predetermined sequence of operation, each of said control electrodes connected to selectively receive said constant supply of voltage, and

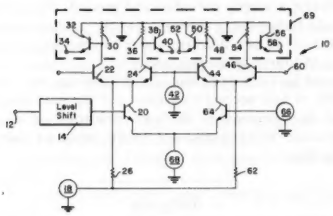
a supply of reference potential applied to one electrode of each of said second transistor means.

3,925,691

CASCODE NODE IDLE CURRENT INJECTION MEANS

James R. Gaskill, Jr., Pacific Palisades, and Don C. Devendorf, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 11, 1974, Ser. No. 450,018
Int. Cl.[2] A03K *17/00*
U.S. Cl. 307—300 **2 Claims**



1. In an ECL network having a lower current switching circuit and a first and second upper current switching circuit, each circuit comprising a plurality of input transistors and a reference transistor, their emitters being connected, each upper circuit having the bases of one of its input transistors connected to input signals, the bases of the other two reference transistors of said upper circuits being connected to each other and to a bias voltage source, the emitters of said first upper circuit being connected to the collector of said first transistor of said lower circuit and the emitters of said second upper circuit being connected to the collector of said second transistor of said lower circuit, the base of said first transistor being connected to a plurality of level shifted input signals and the base of said second transistor of said lower circuit being connected to a bias voltage source the emitters of the lower current switching transistors being connected together and to the collector of a current source transistor, that current source transistor having its emitter connected through a resistor to a negative voltage source and its base to a diode reference circuit, wherein the improvement comprises:

a first and second idle current source, each comprising a resistor;

said first idle current source is connected between said emitters of said first upper circuit and any appropriate negative voltage source or constant voltage point within said circuit, for supplying idle current to said emitters in order to keep said transistors of said first upper circuit partially conducting at all times to reduce said network's switching time;

said second idle current source is connected between said emitters of said second upper circuit and said negative voltage source for supplying idle current to said emitters in order to keep said transistors of said second upper circuit partially conducting at all times to reduce said network's switching time;

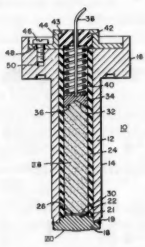
a switch current source comprising a transistor and a resistor, which is connected between said emitters of said lower circuit and said negative voltage source.

3,925,692

REPLACEABLE ELEMENT ULTRASONIC FLOWMETER TRANSDUCER

Walter C. Leschek, and James L. McShane, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 13, 1974, Ser. No. 479,057
Int. Cl.[2] H01L *41/04*
U.S. Cl. 310—8.7 **2 Claims**



1. An acoustic transducer assembly comprising:

an electrically conductive, generally tubular metal transducer housing;

an acoustically transmissive metal window sealingly disposed at one end of the transducer housing, with the exterior and interior surfaces of the metal window being lapped optically flat for optimum acoustic coupling;

a thin disk, piezoelectric transducer element having opposed surfaces lapped optically flat and one such surface in optical contact with the interior surface of the metal window;

an insulating sleeve disposed within the generally tubular metal transducer housing;

a generally cylindrical acoustic wave damping block disposed within the insulating sleeve, which damping block is electrically conductive and has one end surface lapped optically flat and in optical contact with the transducer element disk, while the other end of the damping block has a convex cone shaped terminus;

an electrical contact member disposed within the insulating sleeve and having a concave conically shaped surface which mates with the damping block convex cone shaped terminus, which contact member is retained in physical and electrical contact with the damping block by a coil spring means disposed within the insulating sleeve;

an insulating plate provided at one end of the insulating sleeve contacting the coil spring and having an electrical lead-in extending therethrough connected to the contact member, whereby electrical connection is made to the interior surface of the transducer element serially via the electrical contact member and the conductive damping block, with the metal transducer housing serving as another electrical lead to the other side of the transducer element via the metal window;

a closure member closing the tubular transducer housing and connectable thereto about the insulating plate and contacting the insulating plate to thereby compress the

coil spring to compress together the contact member, the damping block, and the transducer element to the metal window.

3,925,693

MOUNTING DEVICE FOR A QUARTZ RESONATOR

Rene Meister, Neuchatel, and Alain Tyrode, Colombier, both of Switzerland, assignors to Ebauches S.A., Neuchatel and Faubourg de l'Hospital, both of, Switzerland

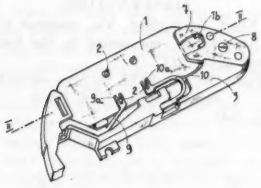
Filed Mar. 21, 1973, Ser. No. 343,240

Claims priority, application Switzerland, Mar. 21, 1972, 4142/72

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² H01L *41/08*

U.S. Cl. 310—9.1 **3 Claims**



1. Mounting device for rigidly and removably mounting a quartz resonator, the resonator including a housing with a quartz crystal therein and at least one pin for providing an electrical connection to the quartz crystal, said mounting device comprising,

support means for supporting the housing of the resonator, said support means including,

a frame including walls which define a notch on one side of the frame for surrounding a first ear of the housing, a resilient conductor secured to said frame, said conductor including means for elastically and electrically coupling the conductor to the pin of the resonator,

said support means also including means for removably and rigidly mounting the housing of the resonator to said frame.

3,925,694

ARRANGEMENT FOR THE TRANSMISSION OF CONTROL COMMANDS FROM A STATIONARY PART TO A ROTATING PART OF AN ELECTRIC MACHINE

Martin Richter, Marloffstein, and Ingo Kröger, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 20, 1973, Ser. No. 399,349

Claims priority, application Germany, Sept. 21, 1972, 2246424

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

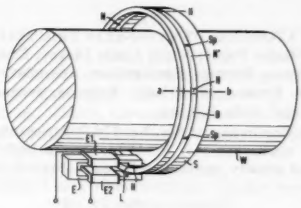
Int. Cl.² H02k *11/00*

U.S. Cl. 310—68 D **11 Claims**

1. Apparatus for the contactless transmission of control commands from a stationary part to a rotating part of an electric machine, which machine is controlled through the use of rotating thyristors comprising:

a. a ring shaped anti-magnetic signal receiving member adapted to be coupled to the machine shaft and having installed, at the circumference of the ring, a plurality of Hall effect generators;

b. a stationary electromagnet having poles forming an air gap located so that said signal receiving member will



rotate therein; and

c. means to provide a control signal to said electromagnet.

3,925,695

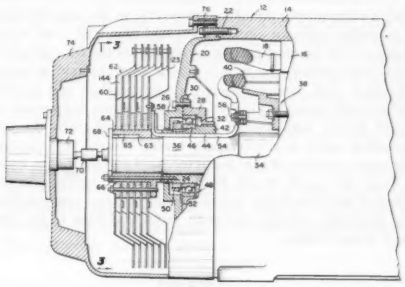
ROTOR RESISTOR AND FAN FOR AC INDUCTION MOTOR

Virgil W. Raby, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed June 25, 1974, Ser. No. 482,888

Int. Cl.² H02K *11/00*

U.S. Cl. 310—72 **4 Claims**



1. A rotor resistor and cooling fan assembly for an electric motor including a stator, a rotor including a shaft, and a winding carried by said shaft and rotatable relative to said stator, said rotor resistor and cooling fan assembly comprising: a cylindrical support member mounted on and drivingly connected with said shaft, a plurality of insulator plates positioned on said cylindrical support member, a plurality of resistor-fan electrically conductive discs each positioned between said insulator plates, means fastening said insulator plates and said resistor-fan discs in an assembled relationship upon said support member with said resistor-fan discs each being electrically insulated from one another, a plurality of fan blades integrally formed on each resistor-fan disc, electrically conductive means fastened between respective pairs of said resistor-fan discs adjacent their outer peripheries providing a current path therebetween, first electric conductor means connecting a radial inward surface of one of said paired resistor-fan discs in circuit with said rotor winding, and second electric conductor means connecting a radial inward surface of the other of said paired resistor-fan discs in circuit with a ground connection providing a complete circuit from said rotor winding whereby a current path is provided from said rotor winding radially outwardly through one of said resistor-fan discs and back radially inwardly through the other of said resistor-fan discs whereby said discs act as a resistor placing a predetermined resistance in accordance with the surface area of said discs in the current path with said rotor winding while said

resistor-fan discs simultaneously pump cooling air across the motor assembly.

3,925,696

STATORLESS DYNAMO-ELECTRIC MACHINE

Encho Nikolov Popov; Nikola Ganev Diakov; Emilia Dobreva-Dimitrova; Roumen Konstantinov Apostolov, and Hristo Petkov Hristov, all of Sofia, Bulgaria, assignors to DSO "Elprom", Sofia, Bulgaria

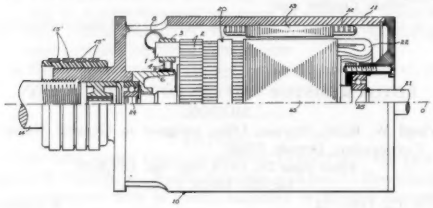
Continuation-in-part of Ser. No. 178,765, Sept. 8, 1971. This application May 16, 1973, Ser. No. 360,910

Claims priority, application Bulgaria, Sept. 8, 1970, 15625

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] H02K *13/00*

U.S. Cl. 310—242 **3 Claims**



1. In a dynamo-electric machine including a rotor armature with a commutator on a face transverse to the axis of rotation, a rotatable inductor centered on said axis, and a set of brush holders with brushes carried by said inductor for contact with said commutator, the improvement wherein said inductor is provided with carrier means for said brushes and elastically deformable mounting on said carrier means supporting each brush holder with limited axial mobility whereby the corresponding brush is centrifugally biased toward said commutator upon rotation of said inductor, said carrier means forming a base for each brush holder disposed radially inwardly thereof, said mounting means forming at least one leg extending generally radially outwardly from said base to the associated brush holder.

3,925,697

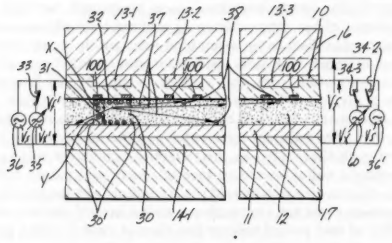
HELIUM-XENON GAS MIXTURE FOR GAS DISCHARGE DEVICE

Michael E. Fein, Toledo, and David C. Hinson, Whitehouse, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Oct. 24, 1972, Ser. No. 300,162

Int. Cl.[2] H01J *17/20*

U.S. Cl. 313—223 **12 Claims**



11. In a gaseous discharge display/memory device comprising an ionizable gaseous medium in a gas chamber formed by a pair of opposed dielectric material bodies having charge storage surfaces in contact with said ionizable gaseous medium, said charge storage surfaces being backed by electrode members, the electrode members behind each charge storage surface being transversely oriented with respect to the electrode members behind the opposing charge storage surface so as to provide a plurality of electrode intersections, each defining a discharge unit, the improvement consisting of the combination of phosphor means on at least one of said dielectric material members at each discharge unit and an ionizable gaseous medium capable on discharge of emitting radiation exciting said phosphor and consisting essentially of about 0.1 to 5 percent atoms of xenon and about 99.9 to 95 percent atoms of helium-based composition, said helium-based composition consisting essentially of about 95 to 100 percent atoms of helium and about 5 to 0 percent atoms of another gaseous component selected from neon, krypton, nitrogen, argon and mercury, whereby upon discharge of at least one of said discharge cells to stimulate the respective phosphor in the device there is no pronounced visible discharge emission to distort phosphor colors.

3,925,698

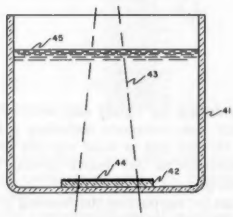
COLLOIDAL SEMICONDUCTOR AND METHOD OF MANUFACTURE

Herbert A. Stahl, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 12, 1973, Ser. No. 406,048

Int. Cl.[2] H01J *1/14, 19/06*

U.S. Cl. 313—346 **4 Claims**



1. A photocathode comprising:

a transparent window plate; and a base layer on said plate of photoemissively active semiconductor material consisting of individual, colloidal particles deposited by the evaporation of their suspension medium, said particles being under 100 millimicrons in size and formed of compounds from a group consisting of elements from columns III and V, or II and VI, of the periodic system of elements containing a p-type dopant.

3,925,699

PICK-UP TUBES

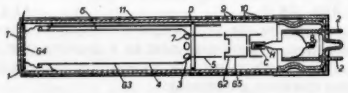
Peter Baldwin Banks, Rawreth, and Hans Scholz, Great Baddow, both of England, assignors to English Electric Valve Company Limited, London, England

Filed July 26, 1971, Ser. No. 166,119

Claims priority, application United Kingdom, July 30, 1970, 36870/70

Int. Cl.[2] H01J *31/38, 31/08*

U.S. Cl. 313—384 **24 Claims**



1. In a television camera tube of the type comprising an evacuated envelope having a transparent face plate, a photo-

conductive target at said face plate having a surface receiving an image of a scene and constituted of material exhibiting a relatively low dark current, said target having a transparent signal plate between it and the face plate, means for scanning the opposite surface of said target with an electron beam thereby generating an electrical current corresponding to light variations in said said scene, said means including an electron gun for generating an electron beam remote from said target and means for deflecting the electron beam before it reaches said target and a tubular anode electrode having one end adjacent said opposite surface of the target and extending therefrom to adjacent said electron gun, said electrode having opening means therein spaced from said one end thereof, and means for illuminating said opposite surface of said target through said opening means and that portion of the tubular anode electrode lying between said opening means and said one end of the electrode to produce an artificial dark current for reducing build up and decay lag at low light level operating conditions, the improvement wherein:

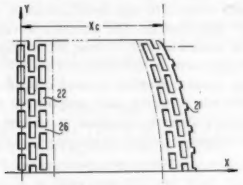
said means for illuminating comprises a light scattering surface on the inner surface of said portion of the tubular electrode lying between said target and said opening means, light source means disposed in spaced relation to said opening means and exteriorly of said electrode for illuminating said opposite surface of the target through said portion of the electrode as aforesaid, diffuser means located adjacent said opening means and extending circumferentially around said electrode for shielding said opening means from said light source means and for diffusing light emanating from said light source means prior to reaching said light scattering surface, and said opening means constituting means for admitting diffuse light from said diffuser means into the interior of said anode electrode substantially uniformly circumferentially therearound and inwardly of said light scattering surface whereby substantially uniformly to illuminate said opposite surface of the target.

3,925,700

SHADOW MASK FOR A BLACK-STRIPE COLOR PICTURE TUBE HAVING SUCCESSIVELY CURVED PERFORATIONS

Yuji Saito, Tokyo, Japan, assignor to Nippon Electric Company Limited, Tokyo, Japan

Claims priority, application Japan, Dec. 10, 1973, 48-139463
Filed Dec. 10, 1974, Ser. No. 531,414
Int. Cl.² H01J *29/07*
U.S. Cl. 313—403 **6 Claims**



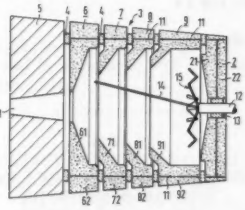
1. In a shadow mask for a color picture tube having a generally rectangular glass face plate of a substantially spherical curvature, and mask having a shape of a similar rectangle and an approximately equal spherical curvature to be positioned substantially parallel to an inside surface of said face plate and having a plurality of perforations formed therethrough, said perforations being elongate in a first direction parallel to a predetermined pair of sides of said similar rectangle and arranged in a regular array with respect to said direction and to a second direction perpendicular to said first direction, the improvement wherein said perforations are arranged, when said mask is extended to coincide with a plane, parallel to said first direction in an area adjacent to a center line bisecting the remaining pair of said sides and, in remaining areas of said mask, along a plurality of curves whose curvatures grow successively larger with an increase in the distance from said center line.

3,925,701

ELECTRON BEAM COLLECTOR ELECTRODE FOR AN ELECTRON BEAM TUBE

Roland Wolfram, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Nov. 4, 1974, Ser. No. 520,469
Claims priority, application Germany, Nov. 8, 1973, 2355902
Int. Cl.² H01J *23/02*
U.S. Cl. 315—5.38 **18 Claims**



1. In an electron beam collector for a transit-time tube to receive an electron beam incident on said electron beam collector having a hollow body closed off in a direction of the incident electron beam by a base member to form a cavity, and a grid located in said cavity in front of said base member and electrically insulated in relation thereto, extending transversely to the direction of the incident electron beam, the improvement of

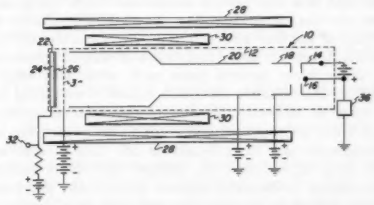
a star grid having a center and a plurality of radially extending members of definite width emanating from said center and terminating in a cavital space, wherein said center is located approximately on the axis of the incident electron beam at entry into said collector.

3,925,702

METHOD AND APPARATUS FOR IMPROVING THE READOUT CHARACTERISTICS OF ELECTRONIC STORAGE TUBES

Steven R. Hofstein, North Brunswick, N.J., assignor to Princeton Electronic Products, Inc., North Brunswick, N.J.

Filed Mar. 8, 1974, Ser. No. 449,397
Int. Cl.² H01J *29/41*
U.S. Cl. 315—12 **64 Claims**



1. The method of improving the readout characteristics of an electronic storage tube system having a charge storage member, a source of a reading electron beam and output signal reading means, which method comprises:

applying a periodic varying voltage between the source of the reading electron beam and the charge storage member to thereby vary the energy level of the electrons in the

reading electron beam relative to the potential pattern on the charge storage member;

the frequency of said periodic varying voltage being higher than the highest frequency of the signal to be read by the output signal reading means;

whereby the usable voltage range of the potential pattern on the charge storage member is increased.

3,925,703

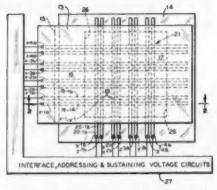
SPATIAL DISCHARGE TRANSFER GASEOUS DISCHARGE DISPLAY/MEMORY PANEL

Jerry D. Schermerhorn, Swanton, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed June 22, 1973, Ser. No. 372,730

Int. Cl.[2] H05B *37/00*

U.S. Cl. 315—169 TV **20 Claims**



1. A gas discharge display/memory device comprising a first and a second conductor having proximate portions, said first and said second conductors being spaced and non-intersecting; a third conductor having an effective electrode region proximate each of the proximate portions of said first and second conductors; a volume of ionizable gas between said first and second conductor proximate portions and said the third conductor effective electrode region; a dielectric layer between said gas volume and at least one of said conductors; an enclosure for said gas volume; said proximate portions of each of said first and second conductors each cooperating with the effective electrode region of said third conductor and the volume of gas therebetween to define respective first and second discharge sub sites; said first and second conductors being conductively isolated from each other and each so spaced from the effective electrode region of said third conductor as to be adapted to maintain an on state of discharge between either of said first and second conductors and said third conductor and to maintain an off state of discharge between both of said first and second conductors and said third conductor respectively when a periodically alternating sustaining voltage is imposed between said third conductor and both of said first and second conductors; and said first and second conductors being so spaced from each other in their portions proximate the effective electrode region of said third conductor as to be adapted to initiate an on state of discharge in a discharge sub site including one of said first and second conductors which is in an off state of discharge in response to an on state of discharge in the discharge sub site of the other of said first and second conductors.

3,925,704

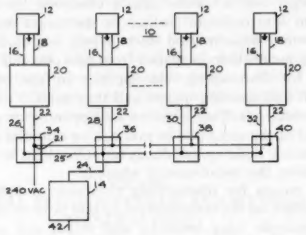
LIGHTING SYSTEM WITH VARIABLE FLASHING RATE

Donald L. Camic, Granada Hills, Calif., assignor to Hughey and Phillips, Inc., Burbank, Calif.

Filed Oct. 24, 1974, Ser. No. 517,601

Int. Cl.[2] G08G *5/00*

U.S. Cl. 315—200 A **17 Claims**



17. A lighting system with variable flashing rate, said system including:

at least one strobe light;

a triggerable ignition circuit coupled to said strobe light; and

a master timer coupled to said ignition circuit, said timer including;

a trigger-control-signal input terminal adapted for the application of a trigger control signal thereto;

at least one trigger-signal-output terminal;

a first source of pulses at a rate corresponding to the frequency of a master source;

a second source of pulses at $1/n$ of the rate of pulses from said first pulse source;

selector switch means having an output terminal and having a plurality of fixed contacts connected, respectively, to said first source of pulses and said second source of pulses having a switch arm movable, selectively, to each of said fixed contacts for providing, at the output terminal of said selector switch, pulses at a rate corresponding to the rate of the pulses at the fixed contact to which the switch arm is selectively moved;

a first decade counter having input and output terminals, one of said input terminals being coupled to said output terminal of said selector switch to receive pulses therefrom at a rate selected by the positioning of said switch arm with respect to said fixed contacts, said output terminals of said first decade counter having thereon, in sequence, pulses spaced in time according to the position of said switch arm in said selector switch; and

switching means coupled to said output terminals of said first decade counter and responsive to the sequential pulses therefrom to produce at said at least one trigger-signal-output terminal trigger-signals, in sequence.

3,925,705

LOW-COST POWER-REDUCING DEVICE FOR HID LAMP

Robert T. Elms, Monroeville, Pa., and Merle E. Keck, Bay Village, Ohio, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 15, 1974, Ser. No. 470,102

Int. Cl.[2] H05B *41/16*

U.S. Cl. 315—246 **7 Claims**

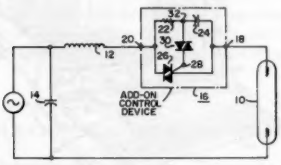
1. In combination, an add-on control device connected in circuit with an HID lamp and current-limiting inductor connected in series therewith, wherein said current-limiting inductor has an inductive reactance of predetermined value to pass a current of average nominal predetermined value to operate said lamp at a predetermined wattage input when said inductor-ballasted lamp is energized by a predetermined AC potential, said add-on control device reducing by a predeter-

mined amount the average nominal current passed by said inductor to reduce by a predetermined amount the wattage at which said lamp will operate, said add-on control device comprising:

a. two electrical circuit paths connected in parallel and each connected to terminals which are connected in series with said series-connected lamp and said inductor;

b. one of said circuit paths comprising a series-connected resistor means and a capacitor means each having predetermined electrical values;

c. the other of said circuit paths having therein a solid-state AC control-signal-responsive switching means having a control terminal, said AC control-signal-responsive switching means is responsive to the application of a control signal to the control terminal thereof to close during each half cycle of said AC energizing potential and to remain closed for the remainder of each such half cycle to supply electrical energy to said lamp, and the point in time during each half cycle of said AC energizing potential at which said AC control-signal-responsive switching



means is closed determining the average current flow through said inductor;

d. solid-state AC voltage-responsive switch means which will conduct only when the AC voltage applied thereacross exceeds a predetermined value, said AC voltage-responsive switch means connecting between the control terminal of said AC control-signal-responsive switching means and the junction of said series-connected resistor means and said capacitor means to provide, when in a conducting state, a voltage control signal to the control terminal of said AC control-signal-responsive switching means to effect a closing of same; and the respective predetermined electrical values of said resistor means and said capacitor means providing a predetermined time constant to predetermine the time during each half cycle of said AC energizing potential said AC voltage-responsive switch means conducts to effect a closing of said AC control-signal-responsive switching means and thus reduce by a predetermined amount said average nominal current passed by said inductor.

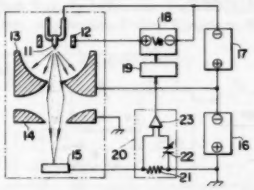
3,925,706

FIELD EMISSION ELECTRON GUN DEVICE OF THE AUTOMATIC CONTROL TYPE

Setsuo Nomura; Tsutomu Komoda, and Yasushi Nakaizumi, all of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 29, 1973, Ser. No. 410,444
Claims priority, application Japan, Feb. 23, 1973, 48-21287
Int. Cl.[2] H01J *29/70*
U.S. Cl. 315—383 **15 Claims**

1. In an electron gun device of the field emission type for generating an electron beam having a disposed along a beam path a cathode having an electron emitting surface, a first anode and a second anode, and further including means for applying an electric voltage between said cathode and said first anode so as to produce an electric field therebetween which causes electrons to be emitted from said cathode toward said first and second anodes, and means for detecting the electron beam current, the improvement comprising a substantially cylindrically shaped control electrode the entire length of which is disposed behind the electron emitting surface of said cathode with respect to the direction of electron emission and voltage control means responsive to said detection means for applying a variable voltage to said control



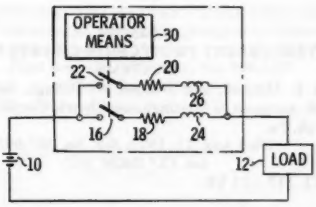
electrode whereby the field emission current from said cathode is controlled in accordance with the output from said detecting means.

3,925,707

HIGH VOLTAGE CURRENT LIMITING CIRCUIT BREAKER UTILIZING A SUPER CONDUCTIVE RESISTANCE ELEMENT

Suresh K. Bhate, Pittsburgh; Robert J. Spreadbury, Murrysville; Michael S. Walker, Pittsburgh, and Frederick J. Young, Edgewood, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 17, 1973, Ser. No. 407,338
Int. Cl. H02h *7/22*
U.S. Cl. 317—11 A **2 Claims**



1. A direct current high voltage current limiting circuit breaker comprising:

a first current path having a first circuit disconnection means in series with a circuit element, which can be actuated from a superconductive state to a normal conductive state;

said circuit element when in the normal conductive state having a first fixed resistance value and a first fixed inductive value;

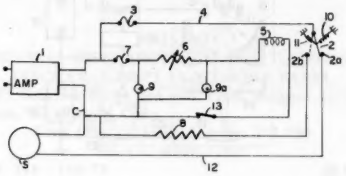
a second current path in parallel with said first current path having a second circuit disconnecting means in series with a second fixed resistance and a second fixed inductance;

an actuator means mechanically connected to said first circuit disconnecting means and said second circuit disconnecting means to open said first circuit disconnecting means and said second disconnecting means together a fixed time after being activated; and said first fixed resistance value, said second fixed resistance value, said first fixed inductance value, and said second fixed inductance value being selected so that a current minimum occurs in the circuit to be interrupted at the fixed time when said actuator opens said first circuit disconnecting means and said second circuit disconnecting means.

3,925,708
SAFETY MEANS FOR AUDIO SPEAKERS

Andrew V. Picciochi, 208 Andrews Road, Mineola, N.Y. 11501

Filed Mar. 25, 1974, Ser. No. 454,234
Int. Cl.[2] H02H 7/20
U.S. Cl. 317—13 R 6 Claims



1. An overload protection circuit for an audio speaker system connected to an audio amplifier, including:

relay means having contacts normally connecting said audio amplifier to said audio speaker system and operative to effect disconnection when the output power from said audio amplifier exceeds a predetermined level; and alternate load means connected to said audio amplifier when said audio speaker system is disconnected; the improvement comprising:

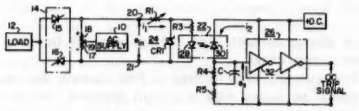
impedance means serially connecting the coil of said relay means across said audio amplifier and adjustable for setting the level at which the output of said amplifier effects operation of said relay means; and

indicator means shunting the coil of said relay means and operative to produce a visual signal when the input power to the coil of said relay means is above a predetermined level; thereby indicating imminent operation of the relay means.

3,925,709
OVERCURRENT PROTECTION CIRCUIT FOR AC SYSTEMS

James T. Mitchell, and William W. Billings, both of Lima, Ohio, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 13, 1973, Ser. No. 387,993
Int. Cl.[2] H02H 3/01
U.S. Cl. 317—33 VR 4 Claims



1. An overcurrent protection circuit for AC systems, comprising;

means for developing a full wave DC sensing voltage whose magnitude is proportional to the load current of the system to be protected;

an optical isolator comprising an optically responsive solid state device and an optically sensitive solid state device in optically coupled relationship, said optically responsive device having a threshold voltage for initiation of conduction that has a predetermined relationship with the sensing voltage magnitude for normal load current;

means to apply said sensing voltage to said optically responsive solid state device;

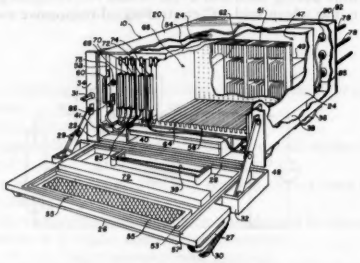
said optically responsive device conducting when said sensing voltage exceeds the threshold voltage and producing radiation to which said optically sensitive device is sensitive;

means responsive to the current through said optically sensitive device to result in an overcurrent trip signal upon occurrence of predetermined overcurrent conditions, said responsive means comprising a resistive-capacitive time delay circuit and a voltage level detector which in combination respond to magnitude of an overcurrent condition to produce a trip signal faster for larger overcurrents.

3,925,710
GENERAL PURPOSE ELECTRONIC INTERFACE EQUIPMENT PACKAGE

Robert H. Ebert, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 1, 1974, Ser. No. 484,746
Int. Cl.[2] H05K 7/14
U.S. Cl. 317—100 10 Claims



1. General purpose electronic interface equipment package for interconnecting a variety of different functions comprising:

an outer chassis having a front opening and a door therefore;

an inner chassis compactly nested within said outer chassis and removable through said front opening;

a row of parallel sockets in the inner chassis for receiving individually a plurality of basic plug-in modules, and of special readily changeable plug-in modules depending on the specific requirements of a given system;

a bus-bar plate mounted in the rear of said inner chassis perpendicular to said sockets having a plurality of connectors for electrically interfacing a selected number of said modules;

a transition plate forming an outer wall of said outer chassis and having a plurality of electrical connectors interconnecting and supporting a plurality of outside and inside cables; and

said inner cables positioned between said outer and inner chassis, and extending from the connectors on the transition plate and capable of being connected to separable connectors on the front end of the plug-in modules;

whereby the inner chassis can be readily removed through the front opening merely by disconnecting the connectors in the front of said plug-in modules.

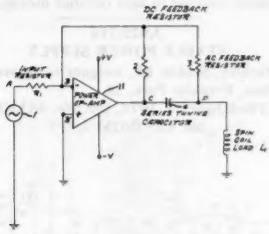
3,925,711
SERIES TUNED SPIN COIL SUPPLY

Wesley C. Sewell, Dunedin, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 29, 1974, Ser. No. 501,725
Int. Cl.[2] G05F 7/00
U.S. Cl. 317—123 3 Claims

1. A series tuned spin coil supply comprising a source of a sine wave input signal of a predetermined frequency, a power operational amplifier receiving said sine wave input signal, said power operational amplifier having input and output terminals, DC feedback means for said power operational

amplifier, AC feedback means for said power amplifier, a series tuning capacitor, and a spin coil load, said series tuning capacitor and said spin coil load in a series arrangement in the



recited sequence connected between said output terminal and ground with the series tuning capacitor selected to resonate with said spin coil load at said predetermined frequency.

3,925,712

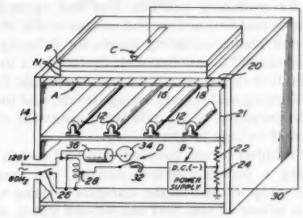
MULTIPLE COPY ELECTROSTATIC HOLD-DOWN APPARATUS

Harold A. Schweriner, Hatfield, Pa., assignor to The Simco Company, Inc., Lansdale, Pa.

Filed Nov. 11, 1974, Ser. No. 522,352

Int. Cl.² G03B 27/62

U.S. Cl. 317—262 E **7 Claims**



1. An electrostatic copyboard for holding a plurality of sheets in laminated disposition thereon comprising:

an insulative plate having opposed surfaces,

a unidirectional high voltage generator having a D.C. output,

applicator means adapted for traversal across the outermost face of each of said sheets as such sheet is successively abutted in laminar disposition against one surface of said insulative plate, and

automatic switching means for cyclically altering the manner of connecting said high voltage generator to said applicator means and said insulative plate so that during a first portion of the cycle said applicator means and the other surface of said insulative plate are coupled across opposite sides of the D.C. output and then during a second portion of the cycle said applicator means and the other surface of said insulative plate are coupled to the same side of the D.C. output whereby discrete areas of positive charges and negative charges are randomly distributed through the various sheets being laminated.

3,925,713

AUTOMATICALLY GUIDING WORKPIECES THROUGH A MACHINE

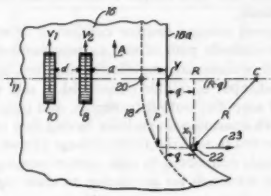
Richard Malcolm Richmond, Rushden, England, assignor to The Shoe & Allied Trades Research Association, Northamptonshire, England

Filed Nov. 7, 1973, Ser. No. 413,426

Claims priority, application United Kingdom, Nov. 9, 1972, 51880/72

Int. Cl. G05b 19/32

U.S. Cl. 318—575 **30 Claims**



1. Apparatus for guiding a workpiece through a machine to present to a work station successive portions of the workpiece located along a curved path, comprising drive means for imparting motion to the workpiece to advance said portions of said workpiece through said work station in a substantially constant direction, means for providing a signal dependent upon the radius of curvature of said curved path to be followed by the workpiece, and control means responsive to said signal for controlling said drive means to cause the workpiece to rotate the workpiece so as to steer the workpiece substantially about the center of curvature of said curved path.

3,925,714

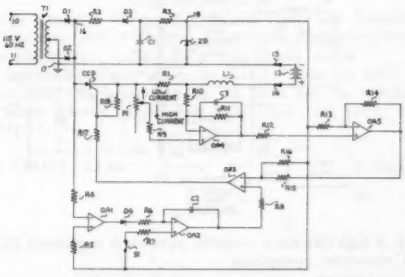
CONSTANT CURRENT BATTERY CHARGING CIRCUIT

Ralph R. Sherman, Jr., Forest, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Sept. 26, 1974, Ser. No. 509,359

Int. Cl.² H02J 7/04

U.S. Cl. 320—39 **3 Claims**



1. An improved battery charging circuit comprising:

a. main input terminals adapted to be connected to a source of alternating current;

b. main output terminals adapted to be connected to a battery to be charged;

c. a rectifier circuit having input terminals connected to said main input terminals and having output terminals for producing rectified alternating current;

d. a reference voltage circuit connected to said rectifier output terminals for producing a direct current reference voltage;

e. a first operational amplifier having first input terminals connected to said rectifier output terminals, second input

terminals connected to said reference voltage circuit, and output terminals for producing reset pulses;

f. a second operational amplifier having first input terminals connected to said first operational amplifier output terminals, second input terminals connected to said reference voltage circuit, output terminals, and a capacitor connected between one of said output terminals and one of said first input terminals for producing a sawtooth voltage at said output terminals;

g. a current control device having an anode-cathode path connected in series between said rectifier output terminals and said main output terminals, and having a control electrode;

h. a current sensing resistor connected in series with said anode-cathode path of said current control device;

i. a third operational amplifier having first input terminals, second input terminals connected to said second operational amplifier output terminals, and output terminals;

j. a fourth operational amplifier having first input terminals connected to said reference voltage circuit, second input terminals connected to said current sensing resistor, and output terminals for producing an error signal indicative of the relative magnitude of the current in said resistor and a selected reference current;

k. means connecting said fourth operational amplifier output terminals to said first input terminals of said third operational amplifier for permitting said third operational amplifier to produce a control signal in response to said sawtooth voltage exceeding said error signal;

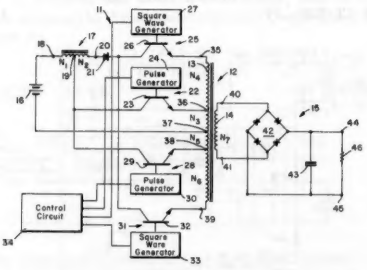
l. and means connecting said output terminals of said third operational amplifier to said control electrode for causing said current control device to conduct in response to said control signal.

3,925,715

REGULATED DC TO DC CONVERTER

H. Dean Venable, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed June 5, 1974, Ser. No. 476,640
Int. Cl.² H02M *3/335*
U.S. Cl. 321—2 **26 Claims**



1. A high efficiency, variable, pulsewidth modulated DC to DC converter, comprising:

input means;

an inductor having first and second windings, said inductor being coupled to said input means;

a transformer having a primary and a secondary, said primary having a plurality of windings provided first, second and third current paths;

first switch means coupled to said first winding of said inductor for conducting current through said inductor and said first current path during a first period of a cycle in response to a first signal;

second switch means coupled to said second winding of of said inductor for conducting current through said inductor and said second current path during a second period of a cycle in response to a second signal;

third switch means coupled to said second winding of said inductor for conducting current through said inductor and said third current path during a third period of a cycle in response to a third signal;

rectifier means coupled to said secondary;

means coupled to said first, second and third switch means for providing said first, second and third signals; and

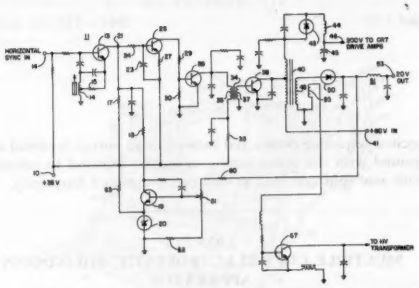
output means coupled to said rectifier means.

3,925,716

STABLE POWER SUPPLY

Donald E. Griffey, Skokie, Ill., assignor to Quasar Electronics Corporation, Franklin Park, Ill.

Filed June 27, 1974, Ser. No. 483,693
Int. Cl.² H02M *3/335*
U.S. Cl. 321—2 **15 Claims**



1. A system for producing a regulated direct current (DC) voltage including in combination:

first circuit means for producing a substantially square wave output at a predetermined frequency and varying between first and second voltage levels on alternate half-cycles thereof;

switch means coupled with the output of said first circuit means for switching between first and second states in response to said first and second voltage levels, respectively, said switch means including means for delaying switching from said second to said first state thereof for a time interval after said first circuit means output attains said first voltage levels following said second voltage levels, said time interval being proportional to the relative magnitudes of said first and second voltage levels;

half-wave rectifier means coupled with said switch means for producing a rectified output voltage, the magnitude of which is proportional to the duration of time said switch means is in one of said first and second states; and

sensing means coupled with said half-wave rectifier means for sensing said rectified output voltage and coupled with said first circuit means for varying said relative magnitudes of said first and second voltage levels.

3,925,717

INDUCTIVE BASE DRIVE FOR TRANSISTOR SWITCHING IN DC CONVERTERS

J. Rothe Kinnard, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 3, 1974, Ser. No. 511,840
Int. Cl.² H02M *3/335*
U.S. Cl. 321—2 **8 Claims**

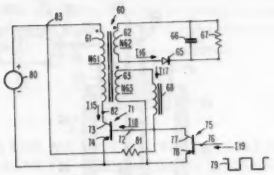
1. A circuit for converting a first DC voltage to a second voltage, comprising:

a transformer having a first winding, a second winding, and a third winding;

switching means connecting said first winding to said first DC voltage for generating said second voltage in said second winding and a third voltage in said third winding, said switching means having a control element responsive to a first current to maintain said switching means in conduction;

said third winding having a first terminal connected to a reference potential of said first DC voltage;

an inductive means connected between a second terminal of said third winding and said control element of said switching means for maintaining conduction of said switching means by supplying said first current to said control element; and



means for connecting said control elements of said switching means to said reference potential for opening said switching means, whereby energy stored in said inductive means and in said transformer is transferred to said second winding.

3,925,718

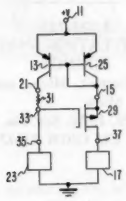
CURRENT MIRROR AND DEGENERATIVE AMPLIFIER

Harold Allen Wittlinger, Pennington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 26, 1974, Ser. No. 526,259

Int. Cl.[2] G05F *1/56*

U.S. Cl. 323—4 24 Claims



1. In combination:

a current mirror including an input terminal, an output terminal, a common terminal, and bipolar transistors, said bipolar transistors of said current mirror having distributed capacitance between base and emitter electrodes which tends to deteriorate the high-frequency performance of said transistor;

means for counteracting said tendency comprising a field effect transistor having a source electrode connected to the output terminal of said current mirror, a gate electrode coupled to the input terminal of said current mirror, and a drain electrode;

a current supply connected between the input terminal of said current mirror and a point of reference potential; and

a load connected between said drain electrode and said point of reference potential.

3,925,719

CIRCUIT FOR SELECTING AN EXTREME VALUE

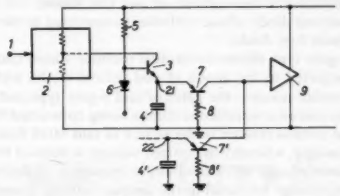
Anton Rodi, St. Ilgen, Germany, assignor to Teldix GmbH, Heidelberg, Germany

Continuation-in-part of Ser. No. 348,262, April 4, 1973, abandoned. This application July 19, 1974, Ser. No. 489,900

Claims priority, application Germany, Apr. 5, 1972, 2216322

Int. Cl.[2] B60T *8/02*; G01R *19/00*

U.S. Cl. 323—16 5 Claims



1. A circuit for selecting an extreme value from at least two potentials of identical and unchanging polarity and having amplitudes within a given range present on different input conductors comprising a plurality of transistors having an amplification factor greater in the normal direction than in the inverse direction, an output conductor, means for connecting the emitter-collector path of each said transistor between one of said input conductors and said output conductor, means for continuously applying a potential as the only control signal to the bases of said transistors for maintaining said transistors conductive while the amplitudes of the potentials present on the input conductors remain within the given range thereby enabling a current to be conducted along their emitter-collector paths so as to cause normal operation of said transistor carrying the desired extreme value and to cause inverse operation of the other said transistors.

3,925,720

DEVICE FOR VARYING OUTPUT VOLTAGE WITHIN A LIMITED RANGE

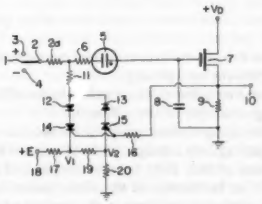
Shunji Minami, Moriguichi; Shunzo Oka, and Takehide Takemura, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 424,717, Dec. 14, 1973, abandoned. This application Dec. 18, 1974, Ser. No. 533,827

Claims priority, application Japan, Dec. 20, 1972, 47-147211[U]

Int. Cl.[2] G05F *1/60*

U.S. Cl. 323—22 SC 6 Claims



1. A device for varying output voltage within a limited range comprising

a. a single-pole, double-throw, center-off switch,

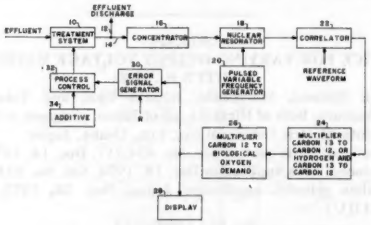
b. a neon bulb having one terminal in series connection with an armature of said switch,

c. a MOS field-effect transistor the gate of said MOS field-effect transistor being connected to one terminal of said neon bulb,
d. a non-polarized capacitor connected between the gate of said MOS field-effect transistor and ground,
e. an output resistor connected between the source of said MOS field-effect transistor and ground,
f. a first diode and resistance means, the anode of said first diode being connected to said armature of said switch through said resistance means,
g. a p-gate type silicon-controlled rectifier whose anode is connected to the cathode of said first diode,
h. a second diode whose cathode is connected to the anode of said first diode,
i. a n-gate type silicon-controlled rectifier whose cathode is connected to the anode of said second diode, and
j. a control resistor, the gates of said p-gate type and n-gate type silicon-controlled rectifiers being connected through said control resistor to the source of said MOS field-effect transistor, whereby the output voltage is derived from the source of said MOS filed-effect transistor while the control voltage for limiting the output voltage is applied to the cathode of the p-gate type silicon-controlled rectifier or to the anode of the n-gate type silicon-controlled rectifier.

3,925,721
PROCESSED SEWAGE EFFLUENT

Peter D. Petroff, 4102 Piedmont Drive SE., Huntsville, Ala. 35802

Filed Nov. 29, 1974, Ser. No. 528,451
Int. Cl.² G01R *33/08*
U.S. Cl. 324—.5 R **11 Claims**

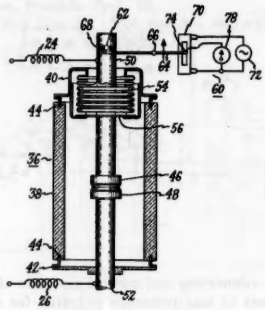


1. A system for the measurement of biological oxygen demand of an effluent comprising:
sample means adapted to be coupled to an effluent line for providing a sample of the effluent;
nuclear resonating means adapted to receive said sample and subjecting it to a magnetic field and for detecting the disturbance of that field by the sample and providing as an output an indication of the disturbance of that field;
correlation means responsive to the output of said nuclear resonating means for comparing said output to a signal representative of the disturbance of said field by a sample containing a known substance representative of a known biological oxygen demand; and
conversion means responsive to the output of said correlation means for indicating the level of biological oxygen demand in said sample.

3,925,722
WEAR INDICATOR FOR VACUUM CIRCUIT INTERRUPTER

Howard A. Fohrhaltz, Lanesborough, and Richard D. Blackburn, Dalton, both of Mass., assignors to General Electric Company

Filed May 1, 1972, Ser. No. 249,136
Int. Cl.² G01R *31/02;* **H01H** *9/16*
U.S. Cl. 324—28 R **4 Claims**

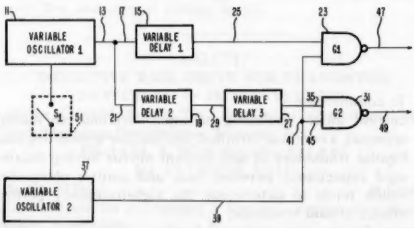


1. A wear indicator for indicating the wear between the fixed contact and the movable contact of a switch device, said wear indicator comprising a lever, one end of said lever being mechanically connected to said movable contact, the other end of said lever being connected to the slide wire of an electrical resistance, said lever being pivoted about a pivot secured to said lever between said ends, a source of voltage connected across said resistor, an electrical meter connected between said slide wire and one end of said electrical resistance, movement of said movable contact into said fixed contact because of contact wear pivoting said lever, moving said slide wire along said electrical resistance to thereby change the reading of said electrical meter to indicate the wear of said contacts.

3,925,723
SYSTEM FOR SIMULATING SWITCH CONTACT BOUNCE

Lawrence A. Millben, Detroit, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 29, 1974, Ser. No. 528,436
Int. Cl.² G01R *31/02*
U.S. Cl. 324—28 CH **10 Claims**



1. A system for electronically simulating the mechanisms of switch contact bounce comprising:
first variable oscillator means for determining the switch transfer rate of the system;
first delay multivibrator means responsive to said first variable oscillator means for generating the low frequency component of contact bounce attributable to a normally-closed side of a switch;

second delay multivibrator means responsive to said first variable oscillator means for determining the time of the flight of said switch;

third delay multivibrator means responsive to the output of said second delay multivibrator means for generating the low frequency component of contact bounce attributable to the normally-open side of a switch;

second variable oscillator means for generating the high frequency component of contact bounce; and

output gating means coupled to said first delay multivibrator means, said third delay multivibrator means and said second variable oscillator means for gating an electrical output signal which simulates the mechanisms of switch contact bounce.

3,925,724

APPARATUS FOR MEASURING THE HYSTERESIS CURVE OF MAGNETIC BODIES USING A MAGNETIC POTENTIAL COIL

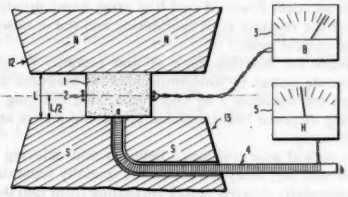
Erich Steingroever, Bonn, Germany, assignor to Elektro-Physik, Hans Nix & Dr. Ing. E. Steingroever, KG, Cologne, Germany

Filed Nov. 9, 1973, Ser. No. 414,324

Claims priority, application Germany, June 6, 1973, 2328690

Int. Cl.² G01R *33/00*

U.S. Cl. 324—34 R **8 Claims**



1. In apparatus for measuring the internal field intensity *H* of a sample body of magnetic material having opposite pole surfaces extending in parallel planes by subjecting a sample body to a magnetic field of variable intensity having lines of force passing through said sample body in directions perpendicular to said parallel planes, the improvement which comprises an elongated magnetic potential measuring coil means having a non-magnetic core and a uniform winding area density along its length, one end of said measuring coil means being disposed in contact with one of the pole surfaces of said body, while being subjected to said magnetic field; the other end of the measuring coil means being disposed in a zone having a neutral magnetic potential with respect to the opposite pole surfaces of the sample body, and a fluxmeter connected with said coil means, means for generating a magnetic field of variable intensity comprising an adjustable magnetic measuring yoke provided with a pair of opposing soft iron pole pieces for contact with the respective opposite pole surfaces of said sample body, said one end of the measuring coil means being embedded in one of said soft iron pole pieces, the other end of the measuring coil means extending exteriorly of said pole piece.

3,925,725

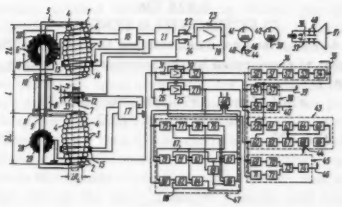
OSCILLOSCOPIC FERROMETER

Vitaly Moritsovich Mogilevsky, ulitsa O. Zhilinoi, 92-b, kv. 23; Nikolai Filippovich Deriga, ulitsa Ilicha, 19, kv. 48; Vadim Petrovich Ekimov, ulitsa Schetinkina, 48, kv. 33; Alexandr Petrovich Erastov, ulitsa Bogatkova, 205, kv. 15; Viktor Vladimirovich Posokhin, ulitsa A. Lezhena, 30, kv. 35, and Benya Elievich Furer, ulitsa Promyshiennaya, 1, kv. 12, all of Novosibirsk, U.S.S.R.

Filed Sept. 23, 1974, Ser. No. 508,470

Int. Cl.² G01R *33/12*

U.S. Cl. 324—34 R **19 Claims**



1. An oscilloscopic ferrometer comprising: a magnetizing means; a measuring channel for magnetization interrelated with said magnetizing means; a measuring channel for a magnetizing field interrelated with said magnetizing means; a circuit for measuring the parameters of a dynamic remagnetization loop of a sample being tested; said magnetizing means comprising: a step-down transformer; a core of said stepdown transformer; a single-turn secondary winding of said stepdown transformer; at least two identical ellipsoidal solenoids connected to said secondary winding, said solenoids being coaxially arranged relative to each other with an air gap therebetween and each having hollow turns with uniform pitch along the generatrix; a direct current lead and a return current lead establishing an aiding-series connection between said ellipsoidal solenoids, said current leads constituting an integral part of said single-turn secondary winding; said current leads comprising hollow coaxial cylindrical bodies; said return current lead extending inside and direct current lead; manifolds connected to said coaxial cylindrical bodies; cooling fluid flowing through the hollow turns of said ellipsoidal solenoids, said secondary winding and said manifolds; said measuring channel for magnetization comprising: a measuring coil located in the central zone of said air gap; a compensation coil coaxially disposed with respect to said current lead of the secondary winding; a field intensity sensor of said measuring channel for magnetizing field; a cathode-ray tube having a control electrode and deflecting plates to fix an image of the dynamic remagnetization loop of the sample being tested placed inside said ellipsoidal solenoids which create a uniform magnetic field so that the intensity of this field and magnetization of said sample are converted in said measuring channels into electric signals fed to the electrodes of said cathode-ray tube; the geometric dimensions of said ellipsoidal solenoids being selected on the basis of the following relationship therebetween and the dependence on the size of said air gap:

$$\frac{R_L}{L} = -0.1368K^3+0.0822K^2+0.7168K+0.007 \quad \Big| \; K\epsilon\, 0.1+0.9$$

$$K = 1.108 \left(\frac{l}{L}\right) 0.6415$$

wherein R_L is the radius of the effective opening of said ellipsoidal solenoids;

L is equal to one-half of the length of said ellipsoidal solenoid;

l is the size of said air gap between said solenoids,

k is a coefficient of constriction of the generatrix of said solenoid,

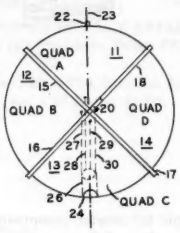
the symbol ϵ indicates that K belongs to the set of $0.1 + 0.9$.

3,925,726

ELECTRIC FIELD SENSOR

Arthur A. Few, Houston, Tex., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 8, 1974, Ser. No. 468,128
Int. Cl.² G01R 31/02
U.S. Cl. 324—72 **7 Claims**



1. An improved balloon electric field sensor comprising:

a. a superpressure balloon having a substantially spherical surface when inflated and having a vertical axis;

b. said surface of said balloon being divided into a plurality of segments wherein each segment is electrically insulated from another;

c. electronic circuitry positioned inside said balloon surface;

d. one group of said surface segments being connected to said electronic circuitry for measuring any vertical electrical field component in the atmosphere and a second group of surface segments coupled to said electronic circuitry for measuring any horizontal electrical field component in the atmosphere; and,

e. said electronic circuitry including means for measuring said electrical field components and means for transmitting said information to a remote location.

3,925,727

OPTICAL SAMPLING OSCILLOSCOPE UTILIZING ORGAN ARRAYS OF OPTICAL FIBERS

Michel Albert Duguay, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

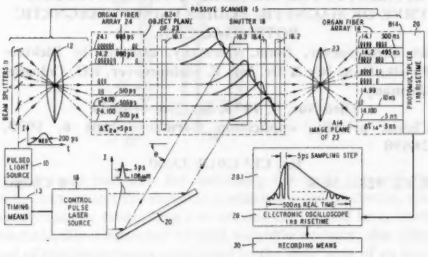
Division of Ser. No. 401,635, Sept. 28, 1973. This application Mar. 10, 1975, Ser. No. 556,636
Int. Cl.² G01R 13/20; G02B 5/14
U.S. Cl. 324—121 R **6 Claims**

1. An optical sampling oscilloscope for displaying on an electronic display device an optical pulse of duration T less than the risetime τ_R of said device, comprising, in combination:

a. means for producing from said light pulse of duration T a plurality of light pulses propagating along spatially separate paths, each of said plurality being substantially identical in transverse shape to the light pulse from which it is produced,

b. a first array of optical fibers of different lengths with the difference in length between functionally adjacent fibers being uniform, each of said fibers being arranged so that one end thereof terminates in an input plane and the opposite end thereof terminates in an output plane, said difference in length producing a substantially uniform difference in time delay $\Delta\tau_1$ between functionally adjacent fibers so that $\Delta\tau_1 > T$, and

c. means for coupling each of said plurality of light pulses into separate ones of said fibers at said input plane so that said plurality of light pulses arrive at said output plane at different times and in different spatial locations, thereby to scan said output plane,



2. said difference $\Delta\tau_1$ in time delay between said functionally adjacent fibers of said first array being greater than both the risetime τ_R of said device and the duration T of said optical pulse,

3. means for delaying each of said plurality of spatially separate pulses by uniformly different amounts $\Delta\tau_2$ less than the duration T of said pulses, said delaying means being disposed betweeen said producing means and said first array,

4. an optical gate positioned between said delaying means and said first array to receive the spatially separated and sequentially delayed pulses emanating from said delaying means,

5. control means for opening said gate for a time period equal to a sample time t_s, coincident in real time but time-wise separated by $\Delta\tau_2$ in sampling time, and

6. detecting means for converting said delay pulse samples into electrical analogs thereof and for reconstructing a sampled version of said optical pulse on a time scale greater than τ_R for display on said device.

3,925,728

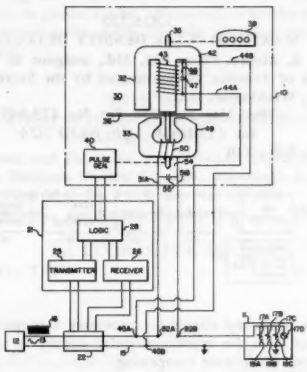
INDUCTION WATTHOUR METER FOR POWER SYSTEMS TRANSMITTING CARRIER COMMUNICATION SIGNALS

Ian A. Whyte, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 21, 1974, Ser. No. 444,583
Int. Cl.² G01R 7/00, 11/32
U.S. Cl. 324—142 **7 Claims**

1. An induction watthour meter for power systems transmitting carrier communication signals, comprising: an electromagnetic assembly including a voltage magnetic section having stator core made of a ferrite magnetic material and a current magnetic section having stator core made of a ferrite magnetic material; a voltage metering coil on said stator core of said voltage magnetic section; and a current metering coil on said stator core of said current magnetic section so as to define a metering circuit including said voltage and current metering coils connectable to power line conductors of a

power system for measuring the consumption of electrical energy of a customer electric load with said power line conductors transmitting high frequency carrier signals of a communication system connected to said power system; a terminating impedance network including said current metering coil and a capacitor element connected together to define a



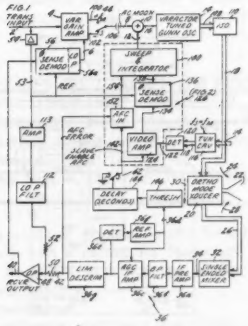
parallel resonant circuit tuned to said carrier signals such that said resonant circuit presents a predetermined value of impedance that is higher than the impedance of said customer electric load to said carrier signals when occurring in the same power line conductors supplying the electrical energy to the customer load.

3,925,729

SKIRT-TUNED SINGLE OSCILLATOR TRANSCEIVER

Salvatore Amoroso, Fairfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 29, 1974, Ser. No. 501,722
Int. Cl.[2] H04B 1/40
U.S. Cl. 325—17 **8 Claims**



1. In a transceiver, adapted for use in a duplex transceiver system including a pair of such transceivers settable for operation with one in a master mode and one in a slave mode, said transceiver comprising:

a single, voltage-tunable oscillator having means for providing a frequency-controlling voltage input thereto;

an FM receiver, having the same IF frequency in the master mode as in the slave mode;

antenna means for transmitting and receiving microwave energy;

frequency stability means including resonant means responsive to the energy output of said oscillator to provide a feedback signal dependent on the closeness of the frequency of the output of said oscillator to the resonant frequency of said resonant means within a band of frequency differences, the resonant means having the same resonant frequency in the master mode as in the slave mode;

means for coupling energy from said oscillator to said antenna means for transmission thereby, for coupling a small portion of the energy of said oscillator to said frequency stability means, and for simultaneously coupling energy received at said antenna means and a small portion of the energy of said oscillator to the input of said FM receiver; and

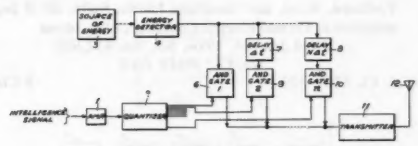
frequency control means including means providing an initial frequency sweep controlling voltage to the input of said oscillator to thereby sweep the frequency of said oscillator to a frequency within said band of frequencies, and having an input connected for response to the feedback signal output of said resonant means, for providing a frequency control voltage to the frequency-controlling voltage input means of said oscillator, and further including means settable to designate said transceiver for operation in the master mode or the slave mode, and operable when set in the slave mode to provide said frequency control voltage in response to said feedback signal to establish operation of said oscillator at a frequency separated from said center frequency by said IF frequency, and operable when set in the master mode to provide said frequency control voltage in response to said feedback signal to establish operation of said oscillator at said center frequency.

3,925,730

SECURE COMMUNICATION SYSTEM

Louis A. de Rosa, Upper Montclair, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Feb. 15, 1966, Ser. No. 527,317
Int. Cl.[2] H04K 1/00
U.S. Cl. 325—32 **10 Claims**



1. A communication system comprising:

a source of intelligence signal;

first means to produce a plurality of other signals, each of said other signals differing from each other by a predetermined time delay and being related to a different magnitude of a predetermined characteristic of said intelligence signal;

second means coupled to said source and said first means responsive to said magnitude of said predetermined characteristic of said intelligence signal to select the appropriate ones of said other signals;

third means coupled to said second means to transmit said selected other signals;

fourth means coupled to said third means to detect said selected other signals;

fifth means to produce replicas of said other signals; and

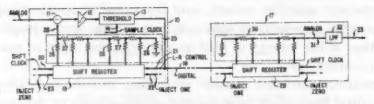
sixth means coupled to said fourth means and said fifth means to compare said detected selected other signals

and said replicas of said other signals to recover said intelligence signal.

3,925,731
DIFFERENTIAL PULSE CODED SYSTEM USING SHIFT REGISTER COMPANDING

Ralph Carter Brainard, Holmdel, and James Charles Candy, Convent Station, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 18, 1974, Ser. No. 461,878
Int. Cl.² H03K *13/22*
U.S. Cl. 325—38 B **25 Claims**



9. In a differential pulse code system, digital signal decoding means comprising

a reversible shift register having an input connection for application of shift clock signals

means, including said shift register, for accumulating information represented by a differential pulse coded signal train,

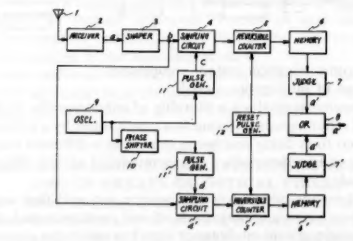
said accumulating means comprises means responsive to said pulse coded signal train for controlling shifting direction in said shift register to shift in a first direction in response to a pulse signal state in said train and to shift in a second direction in response to a no-pulse signal state in said train, said signal train including a succession of signal bit times recurring at the same rate as said clock signals, and

means for deriving from said shift register a discrete analog approximation signal having in each bit time an amplitude corresponding to the binary coded value of the contents of said shift register at that time.

3,925,732
SIGNAL DETECTING DEVICE

Hideki Tanaka, Takatsuki; Mikio Watanabe, Kobe; Minoru Handa, Ikoma; Mitsuhiro Inouchi, Nishinomiya; Shigeru Yoshioka, Kobe, and Kazutaka Ishida, Suita, all of Japan, assignors to Furuno Electric Company, Ltd., Japan

Filed Jan. 14, 1974, Ser. No. 432,856
Int. Cl.² H04B *1/16*
U.S. Cl. 325—325 **5 Claims**

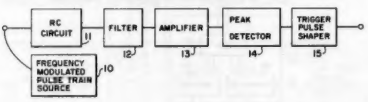


1. A signal detecting device, comprising a receiver for receiving an incoming signal, means for sampling said incoming signal at a frequency synchronized with the frequency of said incoming signal and producing an output indicative of the amplitude of said incoming signal at each sampling position, means for algebraically accumulating the output of said sampling means, means for resetting said accumulating means at predetermined intervals during sampling, means for storing said accumulated output just prior to resetting said accumulating means, and means for generating a signal having a first level when the output level of said means for storing said accumulated output is above a predetermined level and a second level when it is below said predetermined level.

3,925,733
MAXIMUM PULSE DENSITY DETECTOR

Wayne E. Moore, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 24, 1974, Ser. No. 473,049
Int. Cl.² H03K *5/20;* **H03D** *3/26*
U.S. Cl. 328—140 **8 Claims**



1. An improved circuit for providing a trigger pulse synchronous with the maximum pulse density in a frequency modulated pulse train comprising:

means for providing a frequency modulated pulse train having periods of maximum pulse density;

means for forming a waveform from said pulse train, said waveform having an amplitude proportional to the frequency of said pulse train;

means coupled to said forming means for defining peak amplitudes of said waveform;

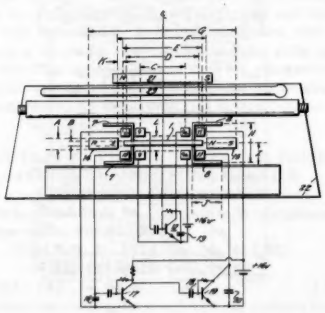
means coupled to said defining means for sensing the peak amplitudes of said waveform; and

means responsive to said sensing means for providing a trigger pulse upon the sensing of a peak amplitude.

3,925,734
OSCILLATOR DEVICE FOR GENERATING SIGNALS OF A PRECISE FREQUENCY

Scudder Smith, 1100 Lake Shore Drive, Menasha, Wis. 54952

Filed Jan. 9, 1974, Ser. No. 432,058
Int. Cl.² H03B *5/36*
U.S. Cl. 331—41 **16 Claims**



1. A electromechanical oscillator device comprising: a vibratory means capable of physical vibration at two discrete substantially harmonically related detectable frequencies;

first means for activating said vibratory means to effect its vibration;

second means responsive to said vibration of said vibratory means and generating electrical signals representative of the vibratory frequencies;

third means for frequency multiplying at least one frequency of the output of the second means to which it is coupled;

fourth means coupled to said third means for frequency dividing at least one of the output signals of the third means;

fifth mixing means coupled to the third and fourth means for mixing the third and fourth means output signal frequencies to produce a beat frequency, whereby said beat frequency is more stable than the vibratory means frequencies.

3,925,735
MODULATION APPARATUS OF SEMICONDUCTOR LASER DEVICE

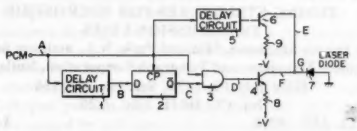
Takeshi Ozeki, and Takao Ito, both of Tokyo, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Mar. 26, 1974, Ser. No. 455,026

Claims priority, application Japan, Mar. 27, 1973, 48-34934

Int. Cl.² H01S *3/19, 3/10*

U.S. Cl. 332—7.51 **10 Claims**



1. Apparatus for modulating a current-modulated semiconductor laser comprising:

a laser diode means responsive to a modulation signal current flowing therethrough to emit a laser beam;

a source of modulation signal which is pulsed on and off according to an information signal;

first circuit means responsive to said modulation signal to produce a compensation pulse when a one-bit modulation pulse arrives after one or more bit time intervals in which there exist no modulation pulses;

second circuit means connected to said laser diode means to cause a compensation current pulse to flow through said laser diode in response to said compensation pulse; and

third circuit means connected to said laser diode means to cause a modulation signal current to flow through said laser diode means in response to said modulation signal.

3,925,736
DIODE QUAD MODULATOR WITH VERY HIGH DYNAMIC RANGE

Dieter R. Lohrmann, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 6, 1974, Ser. No. 504,003

Int. Cl.² H03C *1/58, 1/60*

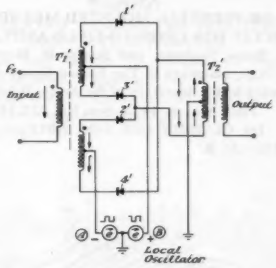
U.S. Cl. 332—43 B **2 Claims**

1. An improved diode quad modulator for mixing a modulating frequency with a carrier RF frequency to obtain an output signal frequency in which the carrier frequency is suppressed comprising:

an output transformer;

an input transformer, said input transformer having a primary input frequency signal receiving means; and a secondary winding, said secondary winding comprising a first branch and a second branch, the positive terminal of said first branch being connected to the negative terminal of said second branch through a pair of series back-to-back diodes, the center connection of said series back-to-back diodes being connected to one end of the primary winding of said output transformer; the negative terminal of said first branch being connected to the positive terminal of said second branch through another pair of similarly connected back-to-back diodes, the center connection of said other pair of series back-to-back diodes being connected to the other end of said primary winding of said output transformer;

a double-ended RF oscillator, said RF oscillator having a grounded connection between the ends of said double-ended RF oscillator, one end of said double-ended RF



oscillator, being connected to a center tap on said first branch of said input transformer secondary winding, and the other end of said double-ended RF oscillator being connected to a center tap on said second branch of said input transformer secondary winding;

center tap to ground connected to the primary winding of the output transformer; and a secondary winding connected to the output transformer for producing an output signal.

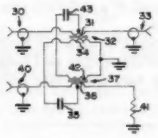
3,925,737
SIGNAL COUPLING APPARATUS

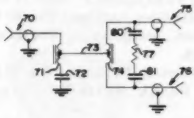
Geoffrey Allen Headley, El Paso, Tex., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Nov. 18, 1974, Ser. No. 524,615

Int. Cl.² H03H *7/48*

U.S. Cl. 333—6 **3 Claims**





1. A directional coupler for coupling a portion of a radio frequency signal from a primary transmission path to a secondary transmission path wherein low frequency power is coupled on said primary transmission path comprising:

a first transformer having a primary winding connected in series with said primary transmission path and a secondary winding connected in shunt with said secondary transmission path;

a second transformer having a primary winding connected in shunt with said primary transmission path and a sec-

ondary winding connected in series with said secondary transmission path;

a first capacitor connected in series with said primary winding of said second transformer for blocking low frequency power therefrom; and

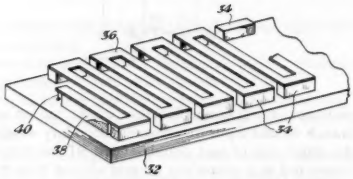
a second capacitor connected in series with said secondary winding of said first transformer for blocking low frequency power induced therein.

3,925,738

RAIL OR PEDESTAL MOUNTED MEANDER LINE CIRCUIT FOR CROSSED-FIELD AMPLIFIERS

Calvin D. Bates, Neptune, and Joseph H. Hartley, Jackson, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 8, 1974, Ser. No. 522,159
Int. Cl.[2] H01P *3/08, 9/00;* **H01J** *23/24*
U.S. Cl. 333—31 R **5 Claims**



1. A meander slow wave structure comprising:

a conductive ground plane;

a meander line conductor means for propogating a wave in a predetermined direction, said conductor means including a continuous conductive material having first and second sets of longitudinal conductors and a set of transverse conductors;

said first and second sets of longitudinal conductors each having a plurality of linearly aligned conductors extending along a line parallel to said predetermined direction; said set of transverse conductors including a plurality of equally spaced parallel conductors each extending transverse to said predetermined direction and each connecting the end of a different one of said conductors from said first set to the end of a different one of said conductors in said second set;

a plurality of dielectric supporting means mounted on said ground plane for supporting said longitudinal conductors and for spacing said transverse conductors above said ground plane.

3,925,739

RADIO FREQUENCY NOTCH FILTER

Dudley C. Brownell, Glen Arm, and Harold W. Jackson, Towson, both of Md., assignors to The Bendix Corporation, Southfield, Mich.

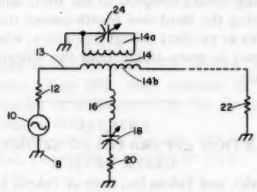
Filed Oct. 2, 1974, Ser. No. 511,150
Int. Cl.[2] H03H *7/10, 7/14*
U.S. Cl. 333—76 **3 Claims**

1. An electrical filter network connected into a transmission line having a current return terminal for selectively attenuating at least one predetermined frequency from a signal encompassing a frequency band propagating therethrough comprising:

a transformer including a secondary winding connected in series in said transmission line and having a primary winding, said secondary winding having an intermediate tap;

means cooperating with said primary winding to be parallel resonant with said primary winding at said predetermined frequency; and,

a reactive circuit connected between said current return terminal and said intermediate tap and tuned to be series



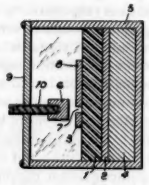
resonant at said predetermined frequency to drain current traversing said secondary winding.

3,925,740

TUNING STRUCTURES FOR MICROSTRIP TRANSMISSION LINES

Peter Dennis Steensma, Midland Park, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed July 19, 1974, Ser. No. 489,956
Int. Cl.[2] H01P *7/00, 1/20*
U.S. Cl. 333—82 B **3 Claims**



1. A tuning structure for a microstrip transmission line comprising:

a substrate;

a ground plane disposed on one surface of said substrate;

a strip conductor disposed on the other surface of said substrate superimposed with respect to said ground plane, said substrate, said ground plane and said strip conductor providing said microstrip transmission line;

a carrier in association with said ground plane to support said microstrip transmission line;

an arrangement including a tuning member associated with said strip conductor and capable of moving inward and outward in a perpendicular relationship with respect to said substrate to change an impedance of said microstrip transmission line and thereby tune said microstrip transmission line; and

an enclosure for said transmission line, said carrier and said arrangement to provide a radio frequency interference shield therefore;

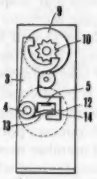
said arrangement further including

a stub strip conductor disposed on said other surface of said substrate spaced from and at right angles to said strip conductor, the spacing of said stub strip conductor and said strip conductor provides a gap in operative association with said tuning member, said tuning member varying a capacitance across said gap and thereby the total shunt impedance presented to said microstrip transmission line.

3,925,741
ELECTROMAGNETIC COUNTER

Shuji Ohtsuka, Yonezawa, and Toshio Sato, Yamagata, both of Japan, assignors to Tamura Electric Works, Ltd., Tokyo, Japan

Filed Aug. 28, 1974, Ser. No. 501,157
Claims priority, application Japan, Aug. 30, 1973, 48-101924
Int. Cl.² H01H *51/08*
U.S. Cl. 335—140 **1 Claim**

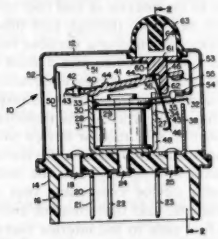


1. In an electromagnetic counter of the type wherein a digit wheel is operated by the movement of an armature of an electromagnet through a ratchet wheel and a plastic pawl, the improvement wherein said pawl comprises a letter L-shaped member, one leg thereof being shaped to actuate said ratchet wheel whereas the other leg being provided with a relatively rigid C-shaped portion and a resilient member, said resilient member engaged by said armature when it is attracted by said electromagnet, said resilient member having a bending strength which is larger than the force necessary to operate said digit wheel but smaller than the attractive force so that the movement of said armature is yieldingly resisted by the resiliency of said resilient member when said armature engages the core of said electromagnet, said C-shaped portion and said resilient member cooperating with each other to define a substantially closed window which receives said armature.

3,925,742
MECHANICAL LATCH RELAY

Rudolph E. Muench, Shelby, N.C., assignor to Fasco Industries, Inc., Rochester, N.Y.

Filed June 25, 1974, Ser. No. 482,868
Int. Cl.² H01H *45/00*
U.S. Cl. 335—186 **11 Claims**

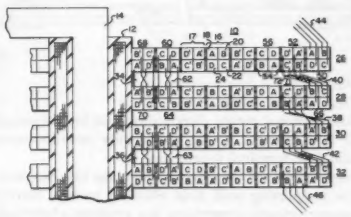


1. a latching relay, comprising
a housing,
a plurality of spaced electrical terminals, secured to said housing
a pair of switches in said housing,
actuating means on said housing operable manually to close one of said switches to complete a first circuit between a first pair of said terminals.
means for releasably latching said one switch in its closed position each time it is moved thereto,
means for closing the other said switches to complete a second circuit between a second pair of said terminals after said one switch has been latched closed, and
means including a relay coil in said housing operative, when energized, to release said latching means,
said coil being connected in series with said one switch, whereby said coil may be energized only when said one switch has been closed by said actuating means.

3,925,743
INTERLEAVED WINDING FOR ELECTRICAL INDUCTIVE APPARATUS

Robert I. Van Nice, Sharon, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 23, 1974, Ser. No. 517,114
Int. Cl.² H01F *27/28*
U.S. Cl. 336—70 **5 Claims**

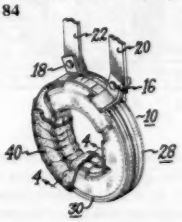


1. An interleaved winding for power transformers, comprising:
at least one coil disc which contains a continuously transposed conductor having a plurality of conductor strands which are spirally disposed around the winding axis for a plurality of turns to form a plurality of stranded conductor locations, with each turn containing a plurality of strand transpositions; and
an interleaving connection which connects together two stranded conductor locations in said winding, and which electrically connects all of the strands in the interleaving connection to each other.

3,925,744
END CAP FOR PRIMARY WINDINGS

Robert S. Canney, Berwick, Maine, assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 13, 1974, Ser. No. 523,255
Int. Cl.² H01F *15/04, 27/28*
U.S. Cl. 336—84 **2 Claims**



1. A composite primary foil winding comprising at least one turn of an electrical conducting foil, a pair of molded end caps mounted on opposite sides of said foil winding, each said end cap provided with an internal and an external radius to relieve electrical stress at the sharp corners of said foil winding, and each said end cap having a plurality of tongues snugly fitting within the central opening of said foil winding to provide mechanical strength to said foil winding, and an electrical

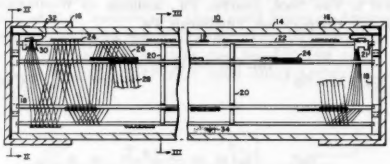
conducting tape wrapped about the exterior surfaces of said end caps.

3,925,745

HIGH VOLTAGE FUSE WITH LOCALIZED GAS EVOLVING SUPPRESSORS

Donald D. Blewitt, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 27, 1974, Ser. No. 483,602
Int. Cl.² H01H *85/44*
U.S. Cl. 337—279 **19 Claims**



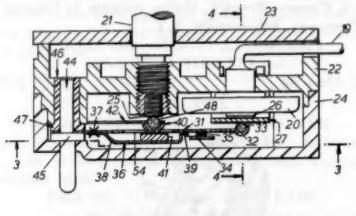
1. An electrical fuse, comprising:
a. fuse housing means;
b. fuse terminal means disposed on said fuse housing means;
c. fuse element means electrically interconnected with said fuse terminal means; and
d. support means disposed within said fuse housing means for supporting said fuse element means thereon, said support means comprising gas evolving-electrically insulating material only in a region near and including a place where said fuse element means is in physical contact with said support means for evolving gas when exposed to an electric arc.

3,925,746

OVEN VALVE CIRCUIT AND THERMOSTATIC ACTUATOR THEREOF

Richard Davis Grayson, Arcadia, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 176,139, Aug. 30, 1971, Pat. No. 3,754,704. This application Sept. 25, 1972, Ser. No. 291,705
Int. Cl.² H01H *37/28, 37/40*
U.S. Cl. 337—309 **1 Claim**



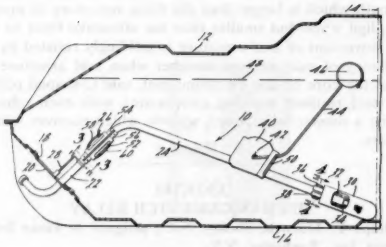
1. A thermostat comprising: a base; first switch means including a first conductive contact; first means on said base to hold said first contact in a first predetermined position; a member movably mounted on said base; temperature sensitive second means mounted on said base to move said member in accordance with temperature; overtravel means spring biased against said member in a direction toward said second means, said member being movable by said second means toward and away from said first contact, said first switch means including a second condutive contact carried by said overtravel means in a position to engage said first contact when said member is close enough to said first means, said overtravel means moving relative to said member when said member is moved toward said first means during engagement of said contacts; and second switch means fixed relative to said base, said second switch means being actuable in response to movement of said member, said second switch means including a leaf fixed at one end relative to said base, said leaf running approximately in a plane parallel to that of said member on the side thereof opposite the side of said member on which said second means is located; and a stop mounted on said base in a position to be engaged by the other end of said leaf on the member side of said leaf, said second switch means having third and fourth conductive contact portions engageable with each other and fixed to said member and said leaf, respectively, said third and fourth contact portions being mutually engaged at and above a predetermined temperature sensed by said second means, said leaf always being spring biased toward said member from a position on one side of said member opposite the side on which said second means is positioned, said leaf being spring biased into engagement with said stop when it engages the same, said third and fourth contact portions being disengaged from each other when said member moves away from said leaf below the stabilized position thereof which it reaches when it engages said stop.

3,925,747

FUEL SENDER MECHANISM FOR A MOTOR VEHICLE

Gary F. Woodward, Ann Arbor, Mich., and Lawrence J. Vanderberg, Hendersonville, N.C., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 11, 1974, Ser. No. 514,060
Int. Cl.² H01C *13/00*
U.S. Cl. 338—33 **1 Claim**



1. An improved fuel sender mechanism for indicating the level of fuel in a fuel tank of a motor vehicle, said fuel sender mechanism being of the type having a tubular device extending from the exterior to the interior of said fuel tank to permit fuel to be withdrawn therefrom through said tubular device, said fuel sender mechanism having a variable resistance device secured to said tubular device and a float mechanism extending from said variable resistance device, said float mechanism varying said variable resistance in response to the level of fuel in said fuel tank, wherein the improvement comprises: a flexible device in said tubular device to permit said float mechanism and variable resistance device to assume a predetermined location with reference to the bottom of said fuel tank, said tubular device comprising first and second tubular metallic elements, said first element extending from the exterior of said fuel tank to the interior thereof and said second tubular element abutting said first tubular element in said fuel tank, said variable resistance device and said float mechanism being attached to said second tubular element, said abutting first and second tubular elements being interconnected by a piece of flexible tubing having an inner diameter approximately equal to the outer diameters of said first and second tubular elements, and spring means for biasing said second tubular element toward the bottom of said fuel tank, said spring means comprising a pair of identical spring steel elements, each of said spring steel elements having one of its ends welded to said first tubular element and having its opposite end welded to said second tubular element, and each of

said spring steel elements having a plurality of ribs, one of said ribs extending in an arcuate path along the length of said piece of flexible tubing and an other rib extending along said piece of flexible tubing to provide torsional stiffness in the flexible joint formed by the interconnection of said first and second tubular elements by said piece of flexible tubing and spring means.

3,925,748

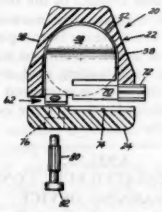
RESISTANCE DEVICE FOR USE IN ENERGIZING THE STARTING WINDING OF A SPLIT PHASE INDUCTION MOTOR

Charles W. Slocum, Spring Lake Heights, N.J., assignor to Thermo-Electronics, Inc., Allenwood, N.J.

Filed Nov. 8, 1973, Ser. No. 413,839

Int. Cl.[2] H01C *1/02*

U.S. Cl. 338—57 **11 Claims**



1. For use in selectively energizing the starting field winding of a split phase induction motor; a positive temperature coefficient resistance device adapted to be series connected with said starting winding, said device including a housing of insulating material having a retaining cavity, a high temperature coefficient resistor disposed in said cavity having two extended area contact surfaces, two contact elements removably mounted in said housing in conductive engagement with said contact surfaces, respectively; said contact elements each including a resilient contact pad having an extended area contact surface resiliently engageable with an extended area of a respective resistor contact surface, and a terminal which projects beyond said housing; the area of contact between the contact surfaces of both said resistor and said pads providing an area current-conducting path therebetween, said cavity having opposed wall portions with said pads being juxtaposed therewith and said resistor surfaces, respectively; said housing having two heat-dissipating openings, each communicating with said cavity and being in registry, respectively, with said resistor contact surfaces, said openings being relatively large for dissipation of heat from said resistor surfaces, said pads lying between said openings and the resistor whereby heat imparted thereto by said resistor may be at least in part dissipated through said openings; and, said pads being of a size corresponding to the contact surfaces on said resistor.

3,925,749

ASYNTHRONOUS PULSE TELEMETRY SYSTEM AND METHOD

Charles R. McLaughlin, and Jerry B. West, both of Dallas, Tex., assignors to The Western Company of North America, Forth Worth, Tex.

Filed Sept. 24, 1973, Ser. No. 400,174

Int. Cl. G01v *1/40*

U.S. Cl. 340—18 P **16 Claims**

11. A system for transmitting randomized pulses comprising:

means for receiving said randomized pulses,

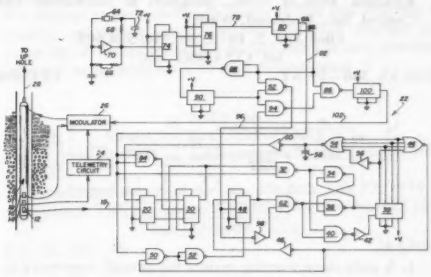
a clock for generating a periodic pulse train having a first frequency,

means responsive to the reception of said randomized pulses for extending the periods of cycles of said periodic pulse train and to provide a series of pulses representative of the reception of said randomized pulses, the extended cycles being out of phase with said periodic pulse train by a predetermined magnitude,

means for transmitting said series of pulses to a remote location,

means for multiplying said series of pulses by a magnitude sufficient that said extended cycles are out of phase with the remainder of said series of pulses by 360 degrees, and

means for generating representations of said randomized pulses in response to the output of said multiplying means.



16. The method of transmitting randomized pulses from a downhole well logging device through a cable to an uphole station comprising:

receiving said randomized pulses at a downhole location,

generating periodic clock pulses,

gating said clock pulses in response to reception of said randomized pulses to delete ones of said clock pulses,

dividing said gated clock pulses to generate a series of pulses having periods representative of the reception of said randomized pulses,

transmitting said series of pulses to an uphole location, and

reconstructing at said uphole location representations of said randomized pulses from said series of pulses.

3,925,750

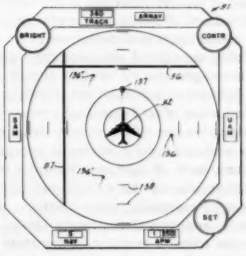
AIR TRAFFIC CONTROL SYSTEM

Glen A. Gilbert, Hialeah, Fla., and James Hobbs, Overland Park, Kans., assignors to Butler National Corporation, Minneapolis, Minn.

Division of Ser. No. 776,209, Nov. 15, 1968, Pat. No. 3,623,090. This application Nov. 19, 1971, Ser. No. 200,633

Int. Cl.[2] G01C *23/00*

U.S. Cl. 340—27 NA **1 Claim**



1. An aircraft navigation instrument comprising:

an aircraft indicia presented at the center of the instrument

and controlled so as to indicate the aircraft's heading,

a vertical indicator on the instrument for indicating the aircraft's offset from a selected ground location,

a horizontal indicator on the instrument for indicating the aircraft's distance to or from said selected ground location,

indicia on the instrument for indicating the position of other aircraft, and

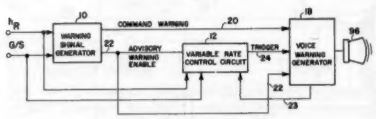
including a larger indicia which represents a selected one of said other aircraft.

3,925,751

GLIDE SLOPE WARNING SYSTEM WITH A VARIABLE WARNING RATE

Charles Donald Bateman, Bellevue, and Hans Rudolf Muller, Kirkland, both of Wash., assignors to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Apr. 2, 1975, Ser. No. 564,505
Int. Cl.[2] G08G *5/00*
U.S. Cl. 340—27 AT **13 Claims**



1. A glide slope warning system for aircraft responsive to a glide slope radio beam and an altitude signal, with a variable warning capacility, comprising:

means for generating a below glide slope voice warning; and

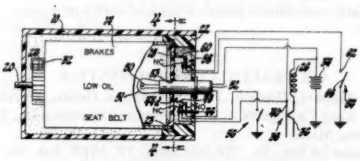
means for varying the repetition rate of said voice warning as a function of the aircraft's deviation from the glide slope.

3,925,752

AUTOMOTIVE VEHICLE ROTARY DISPLAY DEVICE

William K. Jensen, Royal Oak, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 1, 1973, Ser. No. 384,613
Int. Cl. G08h *19/00*
U.S. Cl. 340—52 F **3 Claims**



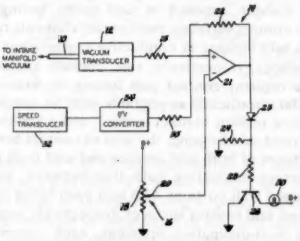
1. An automotive vehicle rotary display apparatus for providing an indication of the occurrence of events at remote locations in the vehicle, comprising: a plurality of event sensors positioned at remote locations in the vehicle, each of said event sensors sensing the occurrence of a respective event for generating a signal upon said occurrence; a viewing window; a drum rotatably supported adjacent the viewing window; a plurality of messages spaced around the drum so as to be sequentially positioned adjacent the viewing window as the drum is rotated, each of said messages representing the occurrence of a respective one of the events; drive means for rotating the drum while said drive means is energized; a plurality of switch means, each of said switch means being associated with a respective one of the events and having a normally closed contact, a normally open contact, and a movable contact normally engaging the normally closed contact; means responsive to the angular position of the drum for shifting the movable contact of the switch means associated with the event represented by the message adjacent the viewing window from engagement with the normally closed contact of said switch means to engagement with the normally open contact of said switch means; means for energizing the drive means, said means for energizing the drive means including a plurality of series circuits coupled to the drive means, each of the series circuits being comprised of a respective one of the event sensors, the movable contact of the switch means associated with the event sensed by said event sensor and the normally closed contact of said switch means, the drive means being energized by the signal generated by an event sensor while the movable contact of the switch means associated with said event engages the normally closed contact thereof; a lamp carried internal of the drum; and means for energizing the lamp, said means for energizing the lamp including a plurality of lamp energizing circuits coupled to the lamp, each of said circuits being comprised of the series combination of a respective one of the event sensors, the movable contact of the switch means associated with the event sensed by said event sensor and the normally open contact of said switch means, the lamp being energized by the signal generated by an event sensor while the movable contact of the switch means associated with said event engages the normally open contact thereof, whereby the drive means is energized in response to the occurrence of one of the events to rotate the drum to position the message representing said event adjacent the viewing window and the lamp is energized to illuminate said message to provide an indication of the occurrence of said event.

3,925,753

SPEED COMPENSATED FUEL CONSUMPTION WARNING DEVICE

John T. Auman, Washington; Wesley A. Rogers, Grosse Pointe Park, and Trevor O. Jones, Birmingham, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 10, 1975, Ser. No. 548,682
Int. Cl.[2] B60Q *1/00*
U.S. Cl. 340—52 R **2 Claims**

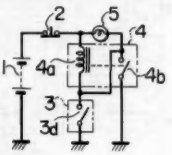


1. A fuel consumption warning device for use with a vehicle powered by a throttle controlled internal combustion engine having an intake manifold, comprising: a vacuum transducer pneumatically coupled with the intake manifold for generating a vacuum signal having a magnitude progressively changing with a progressively increased manifold vacuum level; means for generating a speed signal having a magnitude substantially equal to the difference between the magnitude of the vacuum signal at a manifold vacuum level representing a predetermined excessive fuel consumption at zero vehicle speed and the magnitude of the vacuum signal at a manifold vacuum level representing a predetermined excessive fuel consumption at the instantaneous vehicle speed; means combining said speed signal and vacuum signal and generating an output signal when the magnitude of the combined signals differs with a fixed polarity from the magnitude of the vacuum signal at the manifold vacuum level representing the predetermined excessive fuel consumption at zero vehicle speed; and an indicator responsive to the output signal for producing an operator observable indication representing excessive fuel consumption at the instantaneous vehicle speed.

3,925,754
MILEAGE WARNING SYSTEM

Nobuyoshi Ota, and Hiroyuki Tashiro, both of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 16, 1974, Ser. No. 470,661
Claims priority, application Japan, Sept. 14, 1973, 48-107974[U]; Sept. 14, 1973, 48-107981[U]
Int. Cl.² B60Q *1/00*
U.S. Cl. 340—52 D **4 Claims**



1. A mileage warning system for an automotive vehicle comprising

a battery positioned in said vehicle,

mileage detecting means including a detecting switch of the single pole, double throw type for moving the contact arm of the switch between a pair of fixed contacts each time the vehicle reaches a predetermined distance set by the mileage warning system,

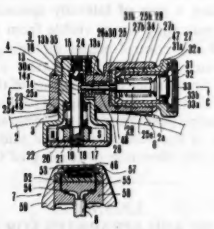
a reset switch means including a second pair of fixed contacts connected with said first fixed contacts of the detecting switch respectively, and

warning means connected with said battery through said detecting means and said reset switch wherein when said predetermined distance is reached, said contact arm closes on a first fixed contact thereby connecting said battery through said reset switch and said detecting switch to energize said warning means and wherein said warning means is deenergized when said reset switch is moved from a first contact to a second.

3,925,755
TIRE PRESSURE ALARM EQUIPMENT

Shigeki Hata, Omiya, Japan, assignor to Kanto Seiki Co., Ltd., Japan

Filed Mar. 8, 1974, Ser. No. 449,442
Int. Cl.² B60C *23/02*
U.S. Cl. 340—58 **8 Claims**

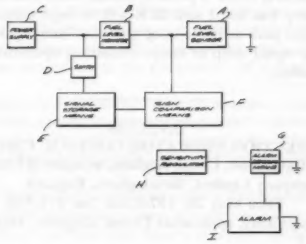


1. Tire pressure alarm apparatus comprising, in combination, a first housing mounted on a wheel rim, rotatably mounted on a vehicle and supporting a tubeless tire, so as to extend at least partially into the air space defined by said rim and said tire; a plunger housing operatively associated with said first housing, a plunger mounted for reciprocation in said plunger housing in a direction substantially perpendicular to a radial plane of said tire, and movable in accordance with the air pressure in said tire; a shaft arranged inside said first housing to extend substantially parallel to said radial plane; anti-friction thrust ball bearing means supporting said shaft at its one end for smooth rotation of said shaft even when subjected to centrifugal force in its axial direction due to rotation of said rim and tire; detent means on said shaft and said plunger interengageable when said plunger is subjected to a tire air pressure having at least a preselected value to maintain said shaft in a first angular position; said plunger moving, to disengage said detent means, when the tire air pressure decreases below said preselected value; means adjustably mounting said plunger housing in said first housing for setting the working pressure to a predetermined value; means biasing said shaft to a second angular position upon disengagement of said detent means; an elongated magnetic member fixed on an end of said shaft to extend diametrically thereof and producing a change in magnetic flux in the space outside said rim during rotation of said rim and tire with said shaft and magnet in said second angular position; a magnetic flux responsive element mounted on a non-rotatable portion of the vehicle at a position wherein it is subject to such change in magnetic flux and operable to produce an output signal responsive to such change; and alarm signal means connected to said element and providing an alarm signal responsive to such output signal.

3,925,756
VEHICLE FUEL LOSS ALARM

Joseph Edwards, Rte. 1, Ludingtonville Road, Holmes, N.Y. 12531

Continuation-in-part of Ser. No. 490,560, July 22, 1974, abandoned. This application Aug. 16, 1974, Ser. No. 498,190
Int. Cl.² B60R *25/10*
U.S. Cl. 340—59 **14 Claims**



1. An alarm circuit for use in a vehicle having a power source, a fuel supply and means for sensing the level of fuel in said supply and for generating a signal in accordance therewith, said circuit comprising an alarm, signal storage means operatively connected to the fuel level sensing means for storing the signal generated by the fuel level sensing means, signal comparison means operatively connected to said storage means and to the fuel level sensing means for generating an actuation signal when said signal from said fuel level sensing means is different from said stored signal and means for energizing the alarm upon receipt of said actuation signal.

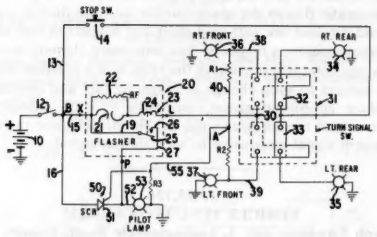
3,925,757
TURN SIGNAL SYSTEM FOR POSITIVE INDICATION OF LAMP FAILURE

Samuel Kimmelman, Cranford, N.J., assignor to Ideal Corporation, Brooklyn, N.Y.

Filed Nov. 23, 1973, Ser. No. 418,571
Int. Cl.² B60Q *1/00*
U.S. Cl. 340—66 **6 Claims**

1. In a turn signal circuit for a vehicle having a D.C. current source, a plurality of signal lamps and a turn signal switch therefor, a flasher load circuit comprising, for connection in series between said source and said turn signal switch, a variable load flasher the contacts of which are closed and opened repetitively in response to current in the load circuit, a load-sensitive relay having normally open contacts, and a first current path including a pilot lamp closable by said relay

contacts, the combination which further includes a second current path containing a silicon controlled rectifier (SCR) in series with said pilot lamp for lighting said pilot lamp and means for applying a triggering voltage to the gate of said SCR and thereby rendering said SCR conductive to activate said second path when said load circuit is activated, said SCR being bridged anode to cathode by a part of said first path, and thereby being rendered non-conductive, when said relay



contacts are closed, said relay being operative to dose said relay contacts in response to normal flow of load current to said signal lamps but being inoperative to close them if the load current is below a predetermined level, whereby when a signal lamp has failed said SCR will be kept conductive and said second path active to keep said pilot lamp lighted steadily while the signal lamp or lamps remaining operative continue being flashed.

3,925,758

DIRECTION INDICATOR CONTROL CIRCUIT

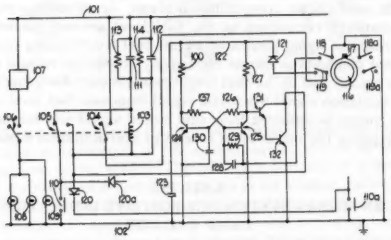
William David Holt, Colne, England, assignor to Lucas Electrical Company Limited, Birmingham, England

Filed May 20, 1974, Ser. No. 471,716

Claims priority, application United Kingdom, May 19, 1973, 23961/73

Int. Cl. B60q *1/34, 1/46*

U.S. Cl. 340—73 **4 Claims**



1. A direction indicator control circuit for a road vehicle, including a manually operable switch biased to an open position, an electromagnetic bistable latching mechanism which is operated when the switch is closed momentarily and serves to close a contact coupling a flasher unit to a flasher lamp, a further momentary closure of the switch serving to operate the latching mechanism again to open the contact, and means operable upon completion of a turn for operating the latching mechanism to open the contact.

3,925,759

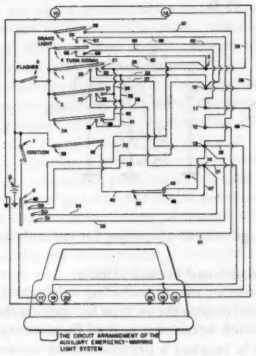
AUXILIARY EMERGENCY WARNING LIGHT SYSTEM

David F. Lucas, 8003 Pine Lake Road, Columbia, S.C.

Filed May 3, 1974, Ser. No. 466,826

Int. Cl.² B60Q *1/52*

U.S. Cl. 340—81 R **5 Claims**



1. An auxiliary emergency warning light system for a motor vehicle comprising

a first set of signaling lamps comprising a pair of laterally spaced high intensity lamps producing light of a first color which is visible from the front of said vehicle,

a second set of signaling lamps comprising a pair of laterally spaced high intensity lamps producing light of a second color which is visible from the rear of said vehicle,

a third set of signaling lamps comprising a pair of laterally spaced high intensity lamps producing light of a third color which is visible from the rear of said vehicle,

control means embodied with said vehicle for causing said lamps to produce a plurality of signals comprising at least a first signal comprising the flashing of the lamps of said first and second sets, a second signal comprising the flashing of the lamps of said first and third sets and a third signal comprising the flashing of the lamps of said first set and the flashing of the lamps of the second and third sets alternately, and said system

further including a pair of laterally spaced high intensity turn signal indicating lamps visible from the rear of said vehicle, and said control means including a vehicle turn actuated switch means for alternately electrically connecting said first flasher means to one of the lamps of said first set and that one of the lamps of said set of turn signal indicating lamps positioned on the same side of the longitudinal axis of the vehicle to cause said lamps to flash according to the direction of turning of the vehicle.

3,925,760

METHOD OF AND APPARATUS FOR OPTICAL CHARACTER RECOGNITION, READING AND REPRODUCTION

Samuel J. Mason, Jamaica Plain; Donald E. Troxel, Belmont, and William F. Schreiber, Lexington, all of Mass., assignors to ECRM, Inc., Bedford, Mass.

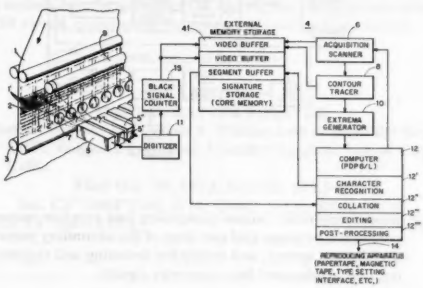
Continuation of Ser. No. 140,830, May 6, 1971, abandoned. This application June 7, 1973, Ser. No. 367,950

Int. Cl.² G06K *9/16*

U.S. Cl. 340—146.3 ED **1 Claim**

1. In a machine-implemented process of character recognition and reading in which text comprising a font of humanly-readable, conventional-language, alpha-numeric characters disposed in lines of characters of predetermined reading se-

quence on a sheet is scanned in line-by-line sequence to produce electrical code symbols corresponding to the scanned characters, a machine-implemented method of editing said text, that comprises detecting during said line-by-line scanning sequence a deletion editing line drawn through a plurality of said characters to indicate intended rub out thereof, detecting during said line-by-line scanning sequence, and in response to editing marks, an insertion to replace the characters to be rubbed out, said insertion comprising a plurality of said characters of said font interlineated between the line of characters



containing said characters to be rubbed out and an adjacent line of said characters without regard for alignment with the characters to be rubbed out, said insertion being delimited at the beginning and end thereof by said editing marks, producing distinctive electrical code symbols corresponding to the insertion characters delimited by said editing marks, and transmitting the character code symbols in the said predetermined reading sequence but with the code symbols corresponding to the rubbed out characters replaced by the code symbols corresponding to the insertion characters.

3,925,761

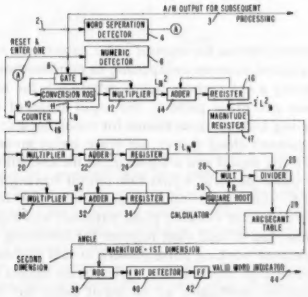
BINARY REFERENCE MATRIX FOR A CHARACTER RECOGNITION MACHINE

Anne Marie Chaires, Lanham; Jean Marie Ciconte, Rockville; Allen Harold Ett, Bethesda; John Joseph Hilliard, Potomac, and Walter Steven Rosenbaum, Silver Spring, all of Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 2, 1974, Ser. No. 494,251

Int. Cl.[2] G06K *9/00*

U.S. Cl. 340—146.3 WD **3 Claims**



1. A binary reference matrix apparatus for verifying input alpha words as valid linguistic expressions, from an OCR having a character transfer function, comprising:

detection means for detecting an alpha word at the input of said apparatus;

conversion means connected to said detection means for assigning numeric values to the characters in the input alpha word based upon the OCR read reliability of the characters;

a first-dimensional bit address calculation means connected to said conversion means for calculating a first-dimensional bit address as a vector magnitude

$$Y^2 = \sum_{N=1}^{M} L_X{}^2$$

of the input word where L_X is the numeric value assigned to each alpha character in the input word by said conversion means;

a counter connected to said detection means for counting the number of characters in the input alpha word;

a second-dimensional bit address calculation means connected to said counter and said conversion means for calculating a second-dimensional bit address as a vector angle arcsecant

$$|Y|\,|R| \sum_{N=1}^{M} L_X N$$

of the input words, where N equals 1, 2, 3, etc., for each character position in the word and

$$R^2 = \sum_{N=1}^{M} N^2;$$

a two-dimensional read only binary array containing bit addresses representing valid linguistic expressions organized to minimize the size of the array needed for accurate verification by choosing numeric values of the alpha characters in inverse proportion to the characters' OCR read reliability;

a first-dimensional accessing means connected to said first-dimensional address calculation means and said two-dimensional read only binary array for accessing said binary array at a bit address equal to the calculated first-dimensional bit address;

a second-dimensional accessing means connected to said second-dimensional bit address calculation means and said two-dimensional read only binary array for accessing said binary array at a bit address equal to the calculated second-dimensional bit address; and

indicator means connected to said two-dimensional read only binary arrary for indicating whether the bit at the calculated bit address in said two-dimensional binary array is on or off and correspondingly whether the input alpha word is valid or invalid.

3,925,762

PATIENT MONITORING AND DATA PROCESSING SYSTEM

Louis J. Heitlinger, Waukesha; John P. Bahr, Wauwatosa; John H. Smith, Milwaukee, and Thomas W. Anderson, Greendale, all of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 25, 1973, Ser. No. 409,738

Int. Cl.[2] H04J *3/00, 6/00;* **H04Q** *11/04, 5/00*

U.S. Cl. 340—150 **45 Claims**

1. A patient monitoring and data handling system for use with hospitalized patients, comprising:

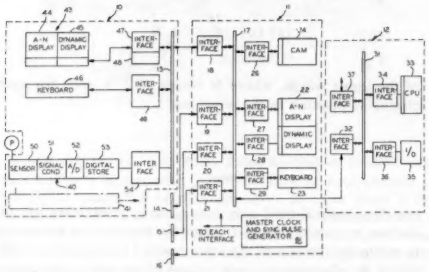
a. a plurality of data sending units for being placed in the vicinity of a hospitalized patient and having means for producing digital data words representative of information pertinent to a patient and a plurality of data receiving units for being placed in the vicinity of said patient and having means for receiving digital words pertinent to monitoring a patient, each of said digital words being assigned to a particular time slot in a sequence of time slots,

b. first data bus means having a conductor for each bit in a data word to permit parallel transmission of the bits comprising a word,

c. means for connecting said sending and receiving units, respectively, to said data bus, said last named means each including gate means and gate enabling means associated with each sending and receiving unit for selectively transmitting data words between an associated sending unit and said data bus and between said data bus and an associated receiving unit when gate means associated with a sending unit and gate means associated with a receiving unit are simultaneously enabled in time correspondence with occurrence of a time slot to which the word to be transmitted is assigned,

d. a source of constant rate clock pulses, said clock pulses corresponding with said sequence of time slots,

e. means for generating a sync pulse signal in response to occurrence of repeatable numbers of clock pulses,



f. pulse counting means associated with each sending and receiving unit and each counting means responding to occurrence of each sync pulse signal by simultaneously initiating counting of clock pulses and continuing to count selected predetermined numbers of ensuing clock pulses so that a counting means associated with at least one of said receiving units reaches its predetermined number of counts in coincidence with counting means associated with at least one sending unit reaching its predetermined number of counts between which units data assigned to a time slot corresponding with occurrence of said coincidence may be exchanged,

g. the said gate means associated with the said ones of said sending and receiving units, respectively, being enabled to respond to said coincidence for said transmitting of said data words and other of said gate means for words assigned to other time slots being enabled sequentially in response to other coincidences at predetermined times whereby respective sending units operate synchronously with receiving units that are intended to receive data from said sending units.

3,925,763

SECURITY SYSTEM

Romesh Tekchand Wadhwani, 5559 Beeler St., and Krishnahadi Sikun Pribadi, 120 Westland Drive, both of Pittsburgh, Pa. 15217

Filed Sept. 13, 1973, Ser. No. 397,158

Int. Cl.[2] H04B *13/02*; **H04Q** *11/00*

U.S. Cl. 340—164 R **10 Claims**

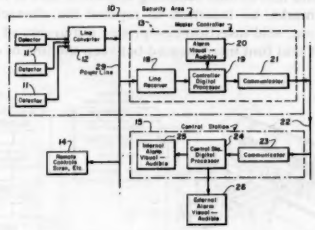
4. A security system for a given security area, such system comprising:

a. security breach detecting means actuable responsively to occurrence of a breach condition,

b. a sensor for encoding and transmitting selfidentification signals responsively to actuation of said detecting means,

c. communication means comprising two lines of a secondary power distribution system of which at least one line is a phase line,

d. line converter means connected between said two lines of the secondary power distribution system, said converter means receiving coded signals, transmitted by said sensor, adding its own self-identification code thereto, and transmitting the resulting synthesized line converter signal at radio frequencies along said two lines and



e. master controller means comprising line receiver means connected between said two lines of the secondary power distribution system, and means for decoding and registering said synthesized line converter signals.

3,925,764

MEMORY DEVICE

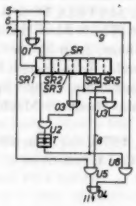
Karl-Heinz Wiesenewsky, Berlin, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Oct. 16, 1974, Ser. No. 515,708

Claims priority, application Germany, Oct. 16, 1973, 2352324; Dec. 8, 1973, 2361680

Int. Cl.[2] H03K *21/00*; **H04Q** *3/02*

U.S. Cl. 340—168 R **27 Claims**



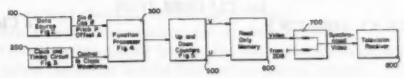
1. A memory device for control pulse patterns in automatic switching control systems comprising in combination: A shift register having $n + 1$ register stages, where n is the number of clock pulses per pulse pattern, the input stage of said shift register having a clock input means for receiving a continuous supply of pattern clock pulses, an erase input means for receiving an erase signal and a signal input means, for receiving a working pulse pattern; a first OR circuit having its output connected to said signal input means and a first input connected to a source of working pulse patterns; and logic circuit means connected to said shift register for detecting the presence of a desired working pulse pattern in said register and for causing the storage thereof, said logic circuit means including a timing means responsive to an input pulse for thereafter producing an output pulse for a predetermined time period, first, second, third and fourth AND circuits, and second and third OR circuits; said first AND circuit having a first input connected to the output of said first register stage, a second input connected to the output of said second OR circuit, and its output connected to the input of said timing means; said second OR circuit having at least one input connected to the output of a register stage other than said first register stage;

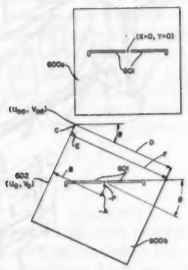
and second AND circuit having a first input connected to the output of said timing means, a second input connected to the output of a penultimate register stage of said shift register, and its output connected to a second input of said first OR circuit; said third AND circuit having a first input connected to the output of the last register stage of said shift register, a second input connected to said clock input means, and its output connected to one input of said third OR circuit; and said fourth AND circuit having a first input connected to the output of said timing means, a second input connected to said first input of said first OR circuit, and its output connected to a second input of said third OR circuit, the output of said third OR circuit constituting the output of said memory device.

3,925,765
DIGITAL RASTER ROTATOR

Ted W. Berwin, and Everett T. Wilbur, both of Playa Del Rey, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 29, 1973, Ser. No. 411,546
Int. Cl.² G06F *3/00, 3/14;* **G01C** *21/20;* **H01J** *29/70*
U.S. Cl. 340—172.5 **15 Claims**





1. A digital system that angularly orients a television raster with respect to a symbol fixed in a memory of said system by coordinate axes rotation, comprising in combination:

a data source for providing data signals and a timing source for providing timing signals, as outputs of said data and timing sources respectively;

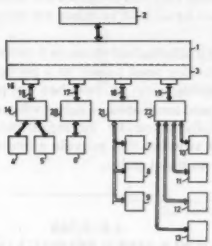
function processing means, electrically connected to the data and timing sources, for providing outputs therefrom in binary form, the function processing means including means for multiplying the rates of change of all absolute values of each argument and modulus of said data signals;

counting means, electrically connected to the function processing means, responsive to outputs from the function processing means providing binary information to said memory, for angularly rotating said coordinate axes during operative mode of said system.

3,925,766
DYNAMICALLY VARIABLE PRIORITY ACCESS SYSTEM

Angelo Bardotti, Cesano Boscone, and Renzo Pederzini, Melegnano, both of Italy, assignors to Honeywell Information Systems Italia, Milan, Italy

Filed Nov. 27, 1973, Ser. No. 419,312
Claims priority, application Italy, Nov. 29, 1972, 32201/72
Int. Cl.² G06F *9/18*
U.S. Cl. 340—172.5 **4 Claims**



1. In a data processing system comprising an information store, a central processor, a plurality of data handling devices, and a plurality of channels provided to enable said data handling devices to communicate with said central processor to provide an information exchange with said store, wherein said data handling devices generate respective request signals when they require communication with said central processor over said channels; priority determining apparatus for variably assigning relative priority levels to said request signals comprising:

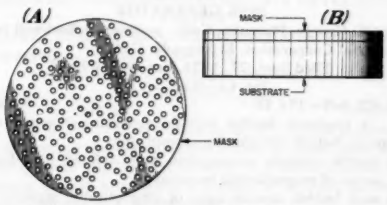
a temporary storage member for each of said channels, each of said storage members being adapted to receive from said central processor and hold a representation of any one of a plurality of different priority levels assigned to the corresponding channel, and

a variable priority network for each of said channels, each of said networks being adapted to receive a request signal for communication on the corresponding channel and response to the representation held in the corresponding storage member for generating a signal representing both said request signal and the priority level assigned by said representation.

3,925,767
RADIATION SET THERMALLY RESET READ-ONLY-MEMORY

Abraham A. Witteles, Forrest Hills, N.Y., and Harry Putterman, Elizabeth, N.J., assignors to The Singer Company, Little Falls, N.J.

Division of Ser. No. 789,054, Dec. 31, 1968. This application June 30, 1971, Ser. No. 158,515
Int. Cl. G11c *11/42*
U.S. Cl. 340—173 LM **6 Claims**



1. The method of forming a reprogramable memory array for a read only memory comprising the following steps:

preparing a semi-conductor substrate having a multiplicity of MOS transistor switches thereon, said switches being wired to form a memory array, each of said switches having substantially the same threshold voltage;

placing a radiation shielding mask over said substrate, said mask having apertures corresponding to preselected ones of said switches;

irradiating said pre-selected ones of said switches by exposing said shielded substrate to radiation to cause a semi-permanent shift in their corresponding threshold values wherein said radiated switches are adapted to store zeros and all non-irradiated switches are adapted to store ones; and

placing said irradiated substrate in a memory reading circuit which provides read pulses to a predetermined plurality of the multiplicity of switches to provide an output whereby said irradiated switches will provide a zero when subsequently gated by an input pulse and said non-irradiated switches will provide a one when subsequently gated by an input pulse.

3,925,768

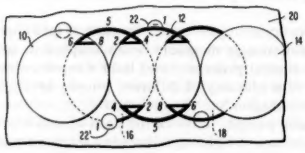
GAPLESS DOUBLE-SIDED PROPAGATION STRUCTURE FOR BUBBLE DOMAIN DEVICES

Yeong S. Lin, Mount Kisco, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1973, Ser. No. 429,000

Int. Cl.² G11C *11/14, 19/08*

U.S. Cl. 340—174 TF **13 Claims**



1. A gapless, double-sided propagation structure for implementing the continuous movement of magnetic bubble domains in a supporting material in response to a reorienting in plane magnetic field comprising a plurality of discs of magnetically soft material disposed in contiguous relation to each other on one surface of said supporting material and a plurality of discs of magnetically soft material disposed in contiguous relationship to each other on the opposite side of said supporting material in aligned relation to said discs on said one side but offset therefrom by one-half of periodicity.

3,925,769

DISK GENERATOR

Peter K. George, Placentia, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sept. 27, 1974, Ser. No. 509,882

Int. Cl.² G11C *11/14*

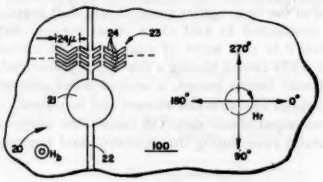
U.S. Cl. 340—174 TF **9 Claims**

1. A magnetic bubble domain generator disposed on a magnetic bubble domain film comprising:

a bubble domain propagation path defined by adjacent areas of magnetizable material

a seed bubble domain area of magnetizable material disposed on the bubble domain film adjacent said propagation path for establishing a seed bubble domain; and

a conductor intersecting said seed bubble domain area of magnetizable material and one of said adjacent areas of magnetizable material in said propagation path for passing a current between said seed bubble domain area and said adjacent areas.



3,925,770

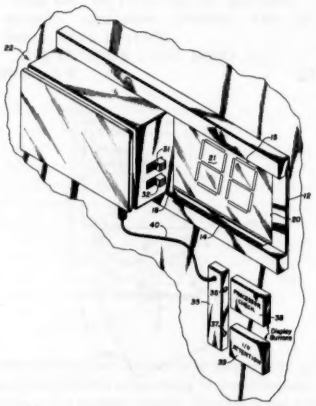
AUDIBLE SIGNALING DEVICE FOR A COMPUTER

Ronald Beacham, Mound; Dennis Covington, Minneapolis, and Reginald McNutt, Long Lake, all of Minn., assignors to Business Electronics, Inc., Minneapolis, Minn.

Filed July 29, 1974, Ser. No. 492,429

Int. Cl.² G08B *21/00*

U.S. Cl. 340—228 S **14 Claims**



1. An audible signaling device for a computer having a visual display window in which at least one halt signal is illuminated, when the computer halts, comprising:

sensing means for sensing the illuminated halt signal from the computer;

electrical means connected to the sensing means for producing an audible signal when the halt signal is sensed;

a frame securely fastened to the computer and surrounding the visual display window; and

a sensor unit housing the sensing means slideably mounted in the frame relative to the visual display window so that when the computer is operating the sensing means can sense the visual display and when the computer is halted the sensing unit may be slideably removed to permit observation of the halt code in the display window.

3,925,771

VOLTAGE CHECKING MEANS FOR AN ELECTRIC CIRCUIT EMPLOYING TWO POWER SOURCES

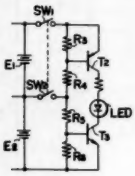
Yoshihiro Satake, Tokyo, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed July 18, 1974, Ser. No. 489,713

Claims priority, application Japan, July 19, 1973, 48-84907[U]

Int. Cl.[2] G01N *27/46*; **G03B** *17/18*; **G01R** *19/16*

U.S. Cl. 340—249 **2 Claims**



1. A voltage checking means comprising:
a first power-source battery for an electric circuit,
a second power-source battery for said electric circuit connected in series to said first power-source battery,
a first pair of resistors connected in series with one another and connected across the terminals of said first power-source battery,
a second pair of resistors connected in series with one another and connected across the terminals of said second power-source battery,
a first transistor having a base electrode connected to the connecting point of said first pair of resistors,
a second transistor having a base electrode connected to the connecting point of said second pair of resistors, and
an indicating element connected between the collector electrodes of said first and second transistors for providing an indication in response to the voltage level of either or both of said batteries falling below a predetermined level.

3,925,772

A.C. POWER SUPPLY CIRCUIT IN COMBINATION WITH AN A.C. SOURCE AND A D.C. SOURCE

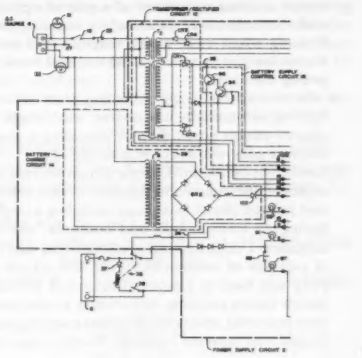
Lowell E. Miller, American Fork, and Gail R. Nielsen, Salt Lake City, both of Utah, assignors to Com Tel, Inc., Salt Lake City, Utah

Filed June 27, 1974, Ser. No. 483,635

Int. Cl.[2] G08B *21/00*; **H02J** *7/00*

U.S. Cl. 340—253 C **22 Claims**

1. An A.C. power supply circuit in combination with an A.C. source and a D.C. source for producing an oscillatory output in response to signals either from the A.C. source, the D.C. source, or both, said power supply circuit comprising
a first rectifier for rectifing the A.C. signal produced by the A.C. source,
a control circuit responsive to a control signal for coupling the D.C. source to the output of said rectifier,
an A.C. sensing circuit coupled to the A.C. source for applying a control signal to said control circuit if the amplitude of the signal produced by said A.C. source falls below a predetermined level, and
an oscillator circuit coupled to the output of said rectifier for producing an oscillatory signal in response to the signal present on the output of said rectifier,
whereby said power supply circuit produces a substantially continuous oscillatory signal by drawing power from the D.C. source to the extent the output on the A.C. source falls below said predetermined level.



3,925,773

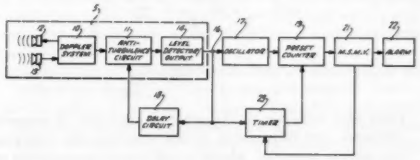
ALARM SIGNAL PROCESSING SYSTEM AND METHOD

Robert Leonard Green, Teddington, England, assignor to Emergency Products Corporation, Parsippany, N.J.

Filed Aug. 31, 1973, Ser. No. 393,566

Int. Cl.[2] G08B *13/18*

U.S. Cl. 340—258 A **4 Claims**



1. In a system for processing the output signal of an alarm system to distinguish alarm conditions from spurious disturbances, oscillator means responsive to the alarm system output signal for producing a cyclical signal of predetermined frequency in the event of a predetermined condition in the alarm system output signal, means for counting the cycles of the signal produced by the oscillator means, means for resetting the means for counting to an initial level a predetermined time after the oscillator means is actuated, and means for providing an alarm signal when the number of cycles of predetermined frequency counted reaches a predetermined number.

3,925,774

FIELD DISTURBANCE TYPE MOTION DETECTION SYSTEM

Clifford L. Amlung, Nutley, N.J., assignor to Security Devices Corporation, Pompton Lakes, N.J.

Filed Mar. 24, 1975, Ser. No. 561,229

Int. Cl.[2] G08B *13/18*

U.S. Cl. 340—258 A **10 Claims**

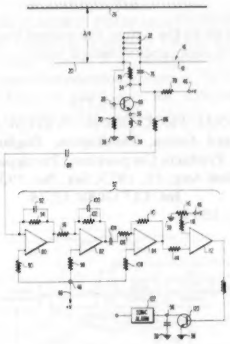
1. A field disturbance motion detection system generating an electromagnetic wave pattern which is radiated to a selected location and being responsive to a predetermined disturbance of said wave pattern thereat to activate an alarm device, comprising in combination:
a housing having a front portion adapted to pass electromagnetic waves therethrough without substantial attenuation;

a printed circuit board in said housing adjacently behind said front portion;

said printed circuit board including thereon a single transceiver antenna comprised of a pair of opposing quarter wave antenna elements including a spacing therebetween forming a half-wave dipole antenna, and tuning control means located in said spacing coupled between said opposing elements;

an electromagnetic wave reflecting plate attached to said housing substantially one quarter wavelength behind said printed circuit board thereby providing a predetermined antenna gain and directional sensitivity;

a transceiver oscillator/detector circuit located immediately adjacent and coupled to said pair of antenna elements on said printed circuit board and including a single transistor having an emitter, base and collector, and additionally including a direct circuit connection of said base to one of said pair of antenna elements, first circuit means coupling said base to a point of reference potential, second circuit means coupling said emitter to said point of reference potential, third circuit means coupling said collector to said one antenna element, fourth circuit means coupling said collector to the other of said pair of antenna elements, and fifth circuit means coupling said collector to a supply potential, whereby said circuit is energized to provide oscillations which are coupled to said antenna whereupon electromagnetic signals of a predetermined frequency are radiated to a localized area which when a field disturbance occurs a change in collector current of said transistor results providing a relatively low level output signal of another predetermined frequency across said fifth circuit means;



bandpass filter-amplifier means coupled to said collector and being responsive to said output signal occurring across said fifth circuit means and being adapted to increase the amplitude of said output signal by a predetermined gain;

comparator circuit means having first and second input means respectively coupled to the output of said bandpass filter-amplifier means and a reference potential whereby a control signal is generated in response to a field disturbance for initiating an alarm when the amplitude of said output signal from said bandpass amplifier exceeds said reference potential.

3,925,775

MULTIPLE DIGIT DISPLAY EMPLOYING SINGLE DIGIT READOUT

Leslie W. Gay, Escondido, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Oct. 26, 1973, Ser. No. 410,166

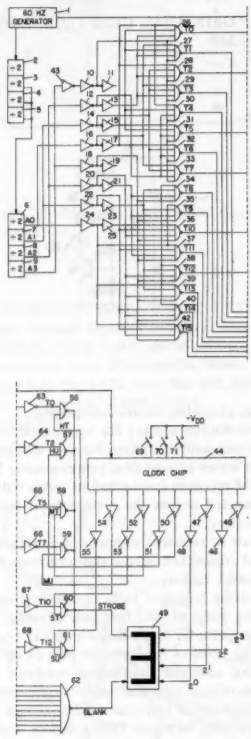
Int. Cl.[2] G08B *23/00*; **G09B** *13/00*; **H05B** *39/00*; **G04B** *19/30*

U.S. Cl. 340—324 R **6 Claims**

1. A method for displaying multiple digit information comprising the steps of:

A. arranging the digits in a predetermined order of significance from most significant to least significant;

B. displaying the most significant previously undisplayed digit on a single digit readout device for a period having a first predetermined duration, said first predetermined duration being in the range from one-eighth to one-half second;



C. blanking the readout device for a period having a second predetermined duration, said second predetermined duration being in the range from one-eighth second to one-half second;

D. repeating steps (B) and (C) until all digits of the information have been displayed.

3,925,776

DISPLAY TERMINAL SYSTEM

Ronald J. Swallow, Upper Marlboro, Md., assignor to Research Corporation, New York, N.Y.

Filed Apr. 18, 1974, Ser. No. 462,171

Int. Cl.[2] G06F *3/14*

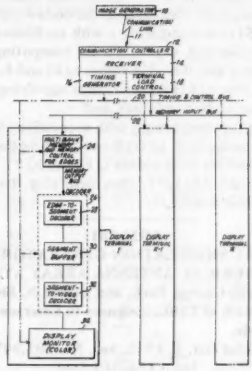
U.S. Cl. 340—324 AD **36 Claims**

1. A system of display terminals, each for displaying a raster pattern along regular scanlines on a two-dimensional screen and each receiving edge definitions, each edge definition comprising signals defining a continuous, visible line on the screen and a plurality of selected visible attributes for a two-dimensional portion of the screen adjacent said continuous line, each display terminal comprising:

edge memory means for storing edge definitions and means for storing in the edge memory means a selected set of edge definitions ordered along at least one coordinate of the screen;

edge-to-segment decoder means for converting at least a selected subset of the edge definitions stored in the edge

memory means to definitions of one-dimensional segments along each of a plurality of defined scanlines across the screen, each segment definition comprising signals defining the position and said attributes of a scanline portion adjacent the intersection of the scanline by an edge line, and



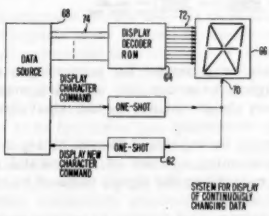
segment-to-video decoder means for converting the segment definition signals into video raster points on the screen, each video raster point being produced by an electrical signal defined by the attributes of the coinciding segment, to provide on the screen a video raster representation of at least a selected subset of the set of edges.

3,925,777

ELECTRONIC CLOCK EMPLOYING REPEATING SEQUENTIAL SINGLE DIGIT DISPLAY

Lloyd Douglas Clark, Palo Alto, Calif., assignor to D. R. Pressman, San Francisco, Calif., a part interest

Filed Sept. 23, 1974, Ser. No. 508,248
Int. Cl.[2] G08B *5/36*
U.S. Cl. 340—336 **8 Claims**



1. A single digit, repetitive sequential display electronic clock, comprising, in combination:

a. a character display matrix for selectively displaying any one of a predetermined plurality of characters in a single, fixed position, said matrix comprising an array of elements which are selectively actuable in predetermined combinations to display said respective characters,

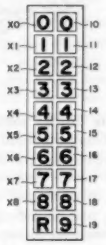
b. driver means for supplying a signal to said display matrix to cause it to display repetitively plural character elapsed time indications, each such indication consisting of a plurality of characters indicative of the number of time units which have elapsed from a predetermined starting time, said plurality of characters being displayed in individual sequence by said character display matrix in the order which they would be read by an observer if all of said plurality of characters were simultaneously presented in a horizontal row, each plural character time indication repeating continuously until at least the least significant portion thereof should change due to the passage of time, whereupon a new time indication, consisting of a new sequence of a plurality of characters indicative of the next higher number of time units which have elapsed from said predetermined starting time, will be repetitively displayed.

3,925,778

CHANNEL INDICATING MEANS FOR T.V. TUNERS

Yasuhiro Wada, Fujimi, and Katsuhiko Okabe, Tokorozawa, both of Japan, assignors to Kabushiki Kaisha Koparu, Tokyo, Japan

Filed Aug. 29, 1973, Ser. No. 392,774
Claims priority, application Japan, Aug. 31, 1972, 47-87246
Int. Cl.[2] G08B *5/36*
U.S. Cl. 340—378 R **4 Claims**



1. A channel indicating means for T.V. tuners comprising:

two adjacent rows of push buttons, one of said rows corresponding to units digits from 0-9; the other of said rows corresponding to tens digits;

indication means associated with each of said buttons for indicating channel availability and selection;

interlocking rod members connected to said buttons corresponding to said tens digits buttons, said interlocking rods being movable between normal and displaced positions;

at least one first signal setting element and at least ten second signal setting elements, located on each interlocking rod, each of said first and second signal setting elements being movable between first and second positions, wherein said indicating means associated with said tens digits buttons are energized when said first signal setting element associated therewith is in said second position and said interlocking rod member is in its normal position and

wherein said indicating means associated with said units digit buttons are energized when said second signal setting elements are in said second position and said interlocking rod member is in its displaced position.

3,925,779

MESSAGE COMMUNICATOR FOR HANDICAPPED PERSONS

Suzanne Gerstenhaber, 4100 Greenbriar Drive, Houston, Tex. 77006

Filed July 10, 1974, Ser. No. 486,947
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—337 **7 Claims**

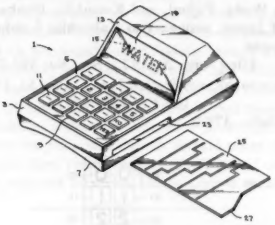
1. The device for enhancing communication from a person having a speech impairment to another comprising:

a portable housing having a bottom surface and an upper surface, the bottom surface being adapted to rest on the lap of the user during operation, the upper surface being characterized by a keyboard panel,

a plurality of message keys disposed in said message panel in visually exposed position to the user, each said message key

being coded on the surface thereof to correspond to a message transmission,

a screen means integrally affixed to the housing proximate an end thereof, said screen means extending substantially vertically upwardly and including a message receiver screen and a message sender screen mounted in back-to-back relation to one another, the message sender screen being visually accessable to the user and the message receiver screen being visually accessable to another person so that a message may be readily transmitted from the sender to such other person,



multiple pair of indicia display means, one indicia display means of each pair being mounted in each screen, and,

an electronic circuit means and power means therefore,

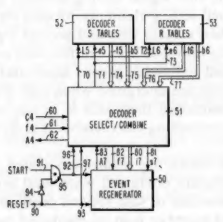
said electronic circuit means disposed in said housing and operably connected to each said respective message keys and to said multiple pair of indicia display means so that pressure applied by the user to any of said keys produces a duplicate visual message on both said screens, thereby providing communication from the user to the receiver.

3,925,780

APPARATUS FOR DATA COMPRESSION ENCODING AND DECODING

David C. Van Voorhis, Los Gatos, Calif., assignor to International Business Machines Corporation, New York, N.Y.

Filed Dec. 26, 1973, Ser. No. 428,500
Int. Cl.² H03K *13/24*
U.S. Cl. 340—347 DD **2 Claims**



1. An apparatus (FIGS. 2 and 9) for decoding variable length code words y into symbols s and i indicative of extended run length code words where s designates either that the number i represents one of $n-f$ code words for ordinary runs of lengths f through $n-1$, or that the number i represents one of $m+f$ code words for special evants, taken as any of m special situations, runs of lengths l through $f-1$, or runs of lengths n, where f is the most frequently occurring run length, the variable length code words being constrained such that the maximum code work length is bounded by a quantity $L_{max} \geq \log_2(m+n)$ and all code work lengths are ordered according to the formulas

$$1 \leq L_r(1) \leq L_r(2) \leq \ldots \leq L_r(n-f) \leq L_{max}$$

$$1 \leq L_S(1) \leq L_s(2) \leq \ldots \leq L_s(m+f) \leq L_{max}$$

the apparatus comprising:

a first stored table TS, a second stored table TR, a third stored table BR, and a fourth stored table TR (**52, 53**);

means for accumulating successive codeword bits Y_1, Y_2, . . . , Y_k to form a single integer $Y=Y_1Y_2 \ldots Y_k$;

means (**51**) for comparing Y with successive elements of the TS table such ath if $Y \quad t_s(k)$, then another bit of y is accumulated; if $y<t_s(k)$, then the codeword y is decoded;

means (**51**) for comparing y with successive elements of the TR table and, if $y<t_r(k)$, for computing the values s and i from y and the table values $t_r(k)$ and $b_r(k)$, such that $s=0$ and $i=y-t_r(k)+b_r(k)+1$, thus signifying that y is the ith regular code word $c_r(i)$; and

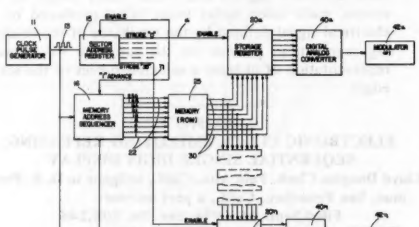
means (**51**) for comparing y with successive elements of the TR table and, if $y \quad t_r(k)$, for computing the values s and i from y and the table values $t_s(k)$ and $b_s(k)$, such that $s=1$ and $i=y-t_s(k)+b_s(k)+1$, thus signifying that y is the ith special code word $c_s(i)$.

3,925,781

DIGITAL MODULATION GENERATOR WITH CYLINDRICAL ANTENNA ARRAY SYSTEM

James S. Hulett, Canoga Park, and Lowell N. Shestag, Woodland Hills, both of Calif., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Oct. 5, 1973, Ser. No. 403,997
Int. Cl.² G01S *1/44*
U.S. Cl. 343—106 R **15 Claims**



1. A modulation generator for generating a plurality of modulation signals for successively separately modulating the radio frequency signals radiated by individual elements of an antenna array, comprising:

a digital memory having stored therein binary coded digital signals representing a series of incremental modulation signals for modulating the signals radiated by each of said antenna elements,

means for addressing said memory to provide successive outputs in binary coded form, said outputs representing the modulation signal associated with each of said antenna elements in sequence,

separate storage register means for receiving the outputs of the memory associated with each of said antenna elements respectively,

digital-analog converter means for converting the outputs of each of said register means to analog form,

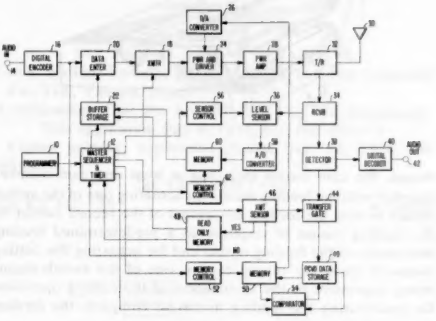
addressing means including means for successively enabling each of said storage register means to provide outputs therefrom in sequence to associated ones of said digital analog converter means, and

modulator means for generating a modulation signal for the radio frequency signals radiated by each of said antenna elements, said modulator means each receiving the output of a respective one of said digital-analog converter means and operating in response thereto.

3,925,782
ADAPTIVE RF POWER OUTPUT CONTROL FOR NET RADIOS

Josef H. Anderl, and George R. Oliva, Jr., both of Eatontown, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 28, 1975, Ser. No. 554,334
Int. Cl.² H04J *3/12*; **H04B** *1/59, 3/60*
U.S. Cl. 343—178 **11 Claims**



1. A simplex data net communication system comprised of a plurality of like participant radio stations operating in a predetermined ordered time sequence wherein at least one station operates as a transmitter/interrogator station which interrupts its transmission of communications signals to the other stations of said plurality respectively operating as receiver/responder stations and interrogates said other stations as to the respective power received from said one station and said other stations respond in their proper time slot to said one station requesting a desired change in transmitted power from said one station, each said participant radio station including as a transmitter/interrogator station;

transmitter and receiver sections alternately coupled to an antenna;

means programmed with data as to the number of said plurality of participants in the net and its respective time slot in the overall operational time sequence of the system;

timing and control means coupled to said programmed means and being operable in response to said data to provide synchronized operational control signals for said station according to its respective time slot;

means coupling a digital interrogation code signal periodically to said transmitter section during said respective time slot in response to control signals from said timing and control means while temporarily suspending normal communications signal transmission, said interrogation code signal being transmitted to said other stations causing said other stations to respond in their respective time slot with a digital coded request signal for a power correction from said transmitter/interrogator section;

means coupled to said receiver section for sequentially receiving and storing each said digital coded request signal from said other stations;

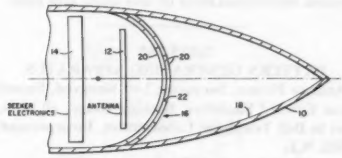
means comparing each digital coded request signal with the next subsequently received digital coded request signal and retaining the request signal for the lesser power correction until all digital coded request signals have been received in sequence from said other stations; and

means coupled from said comparing and retaining means to said transmitter section, being operable to cause a change in the transmitted power output of said transmitter section in response to the digital coded request signal for the least power correction change.

3,925,783
RADOME HEAT SHIELD

Michael P. Bleday, Concord, and Fred R. Youngren, Lexington, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 15, 1974, Ser. No. 524,284
Int. Cl.² H01Q *1/42*
U.S. Cl. 343—705 **5 Claims**

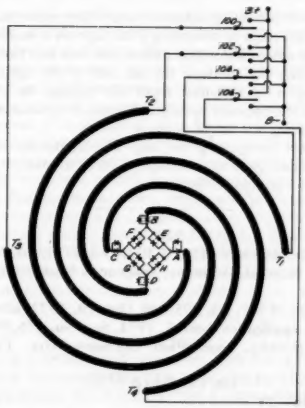


1. In a radar system wherein microwave energy is transmitted from an antenna through a radome, the inprovement of an electromagnetic window comprising: a dielectric heat shield disposed within said radome and spaced apart from the radome inner forward surface for reflecting radiant heat energy and absorbing convection heat energy induced by temperature differences within the radome while allowing microwave energy to pass therethrough, said heat shield having plural concentric layers of spaced apart titanium dioxide epoxy filled paper configured to prevent heat from escaping the aft end of the radome.

3,925,784
ANTENNA ARRAYS OF INTERNALLY PHASED ELEMENTS

Harry R. Phelan, Indialantic, Fla., assignor to Radiation Incorporated, Melbourne, Fla.

Continuation of Ser. No. 192,869, Oct. 27, 1971, abandoned. This application Feb. 6, 1974, Ser. No. 440,182
Int. Cl.² H01Q *19/00*
U.S. Cl. 343—754 **30 Claims**



1. A passive antenna for receiving and reradiating electromagnetic waves comprising:

at least three electrically conductive arms each having an inner end and an outer end,

said arms being spaced apart and symmetrically arranged in a plane and having a common center such that AC electrical signals are induced in said arms by a received elec-

tromagnetic wave and in such a manner that said respective signals differ in phase among said arms, and

interconnecting means located proximate to said inner arm ends at said common center and in said plane for connecting a selected pair of said inner arm ends together with essentially a short circuit for reapplying said phase differing signals to the interconnected arms in such a manner that an electromagnetic wave radiates from the antenna with a phase relationship with respect to the received electromagnetic wave that is determined by the selected interconnections of said inner arm ends.

3,925,785

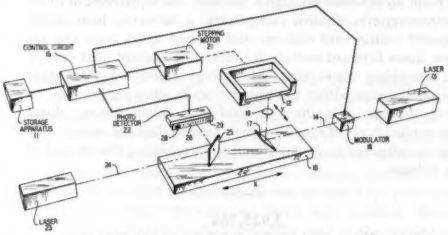
PATTERN GENERATING APPARATUS

Victor Andrew Firtion, Secaucus; Leif Rongved, Summit, and Thomas Edward Saunders, Basking Ridge, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 9, 1974, Ser. No. 496,150

Int. Cl.² G01D *15/24*

U.S. Cl. 346—1 **15 Claims**



1. In a method for forming patterns on a workpiece comprising the steps of forming on the workpiece a film responsive to radiant energy, forming and projecting against the workpiece a writing beam of radiant energy, causing relative movement of the writing beam with respect to the workpiece in orthogonal *x* and *y* directions, whereby the beam scans a surface of the workpiece, and modulating the intensity of the writing beam to describe the desired pattern, the improvement wherein:

the step of providing relative *x*-direction movement comprises the steps of mounting a carriage on a linear bearing surface extending in the *x* direction between two springs, propelling the carriage toward one of the springs, thus causing it to rebound from the spring, be propelled toward the opposite spring and begin reciprocating movement along the linear bearing;

and further comprising the step of periodically imparting kinetic energy to the carriage, thereby to maintain uniformity of carriage reciprocation.

3,925,786

RECORDER WITH CUTTING MECHANISM

Jörg Haas, Neureut, Germany, assignor to Bruker-Physik AG, Germany

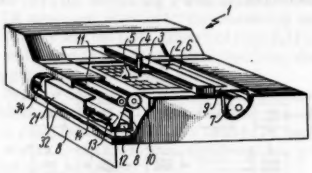
Continuation of Ser. No. 295,840, Oct. 10, 1972, abandoned. This application June 5, 1974, Ser. No. 476,595

Claims priority, application Germany, Oct. 11, 1971, 2150554

Int. Cl.² G01D *15/00*

U.S. Cl. 346—24 **9 Claims**

1. Apparatus for recording a plotting data, especially a recording measuring device of X-Y plotter comprising feeding means including a feed mechanism for moving a strip-shaped record carrier in the longitudinal direction thereof, cutting means for severing the record carrier on which a recording is applied into sheets of predetermined size, the cutting means including a circular-shear device with a helical cutter arranged on the surface of a cylinder rotatable about the axis thereof, a fixed cutter bar being arranged in parallel to the axis of the cylinder, and electric cutting motor means having an output shaft directly coupled with the cutting cylinder, and control means for alternately operating the feeding means and the cutting means such that prior to and after each cutting operation, a feeding operation is effected, the control means including a plurality of cam-controlled switch means and associated cam means for engagement with the cam-controlled switch



means, the cam means including at least one cam member coupled with the feeding means for actuating one of the switch means to stop the feeding movement of the record carrier by the feeding means in response to a predetermined feeding movement of the feeding means and for actuating the cutting means to sever the record carrier, one of the switch means being responsive to the termination of the cutting operation for reactivating the feeding means to complete the feeding movement thereof.

3,925,787

INK JET TYPE PRINTING DEVICE

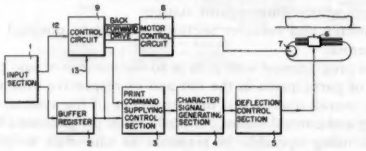
Masahiko Suzuki, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Yamato, Japan

Continuation of Ser. No. 314,950, Dec. 14, 1972, abandoned. This application July 3, 1974, Ser. No. 485,586

Claims priority, application Japan, Dec. 14, 1971, 46-101634

Int. Cl.² G01D *15/18*

U.S. Cl. 346—75 **5 Claims**



1. An ink jet type printing device comprising:

an input section (1) providing character signals and controlling printing;

a recording head section (6) including an ink jet printing means;

a drive motor (7) driving the recording head section (6);

a drive motor control section (8,9) controlling the rotation of the drive motor (7) in both rotary directions;

a character signal generating section (4,5) supplying a deflection-controlled character signal to the printing means;

a print command supplying control section (3) for controllably supplying a print command signal to the character signal generating section (4,5);

a register (2) for storing desired print information, connected to and supplied by an input signal from the input section (1) the output of the register (2) being coupled; to the print command supply control section (3);

and a control circuit means (9) connected to the input section (1), and providing output control signals to the print command supplying control section (3), the control circuit means (9) including means responsive to input

signals from the input section (1) for providing command signals to the motor control section (8,9) for causing the motor control section to controllably excite the motor to move the record head section (6) first backward and then forward for a specific distance before the printing means starts printing characters, and thereafter providing output control signals to the print command supplying control section (3) to enable printing of the information in said register, to thereby prevent non-uniform printing due to initial non-uniform speed of the recording head upon start of movement of the recording head section (6).

3,925,788

INK JET RECORDING APPARATUS

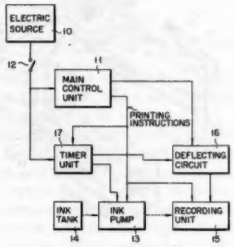
Toshio Kashio, Yamato, Japan, assignor to Casio Computer Co., Ltd., Yamato, Japan

Continuation of Ser. No. 314,947, Dec. 14, 1972, abandoned. This application July 8, 1974, Ser. No. 486,479

Claims priority, application Japan, Dec. 16, 1971, 46-101444

Int. Cl.[2] G01D *15/18*

U.S. Cl. 346—75 **4 Claims**



1. An ink jet recording system comprising:

a source of electric power; and

a recording apparatus selectively coupled to said source of electric power, said recording apparatus including:

a nozzle for emitting ink droplets for printing;

deflecting means including means for deflecting said ink droplets on a recording medium to print characters thereon;

an ink collector for collecting ejected ink droplets which are not used to print characters;

a timing means coupled to said power source for periodically generating an output signal upon the lapse of a predetermined time period when electric power is supplied to said recording apparatus;

a source of print command signals;

ink ejection means coupled to said source of print command signals and to said nozzle for producing a pre-printing ejection of ink droplets from said nozzle for a period of time just prior to the printing of characters and in response to print command signals from said print command signal source, said ink ejection means being further coupled to said timing means for producing a nozzle clearing ejection of ink droplets from said nozzle for a given period of time in response to said periodic output signals from said timing means and independent of said print command signals; and

a deflection control means coupled to said deflecting means and to said timing means for causing said deflection means to deflect said nozzle clearing ejection of ink droplets which are ejected in response to said periodic timing means output signals to said ink collector, thereby maintaining said nozzle in a normal ink ejectable condition over extended periods of time.

3,925,789

INK JET RECORDING APPARATUS

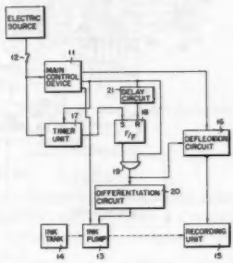
Toshio Kashio, Yomato, Japan, assignor to Casio Computer Co., Ltd., Yomato, Japan

Continuation of Ser. No. 314,999, Dec. 14, 1972, abandoned. This application July 8, 1974, Ser. No. 486,480

Claims priority, application Japan, Dec. 16, 1971, 46-101443

Int. Cl.[2] G01D *15/18*

U.S. Cl. 346—75 **9 Claims**



1. An ink jet recording apparatus comprising:

a recording unit including a nozzle for continuously ejecting ink droplets during a normal printing or recording operation;

means for deflecting said normally ejected ink droplets so as to print characters on a recording medium;

an ink collector for collecting ejected ink droplets which are not used to print characters;

a source of print command signals for instructing the carrying out of a printing operation;

detecting means having an instruction input coupled to said source of print command signals and generating a detection signal responsive to a print command signal, said detecting means including delay means coupled to said recording unit for delaying carrying out of said printing operation for a predetermined period of time; and

preliminary ejection means coupled to said detecting means and to said recording unit, and including means for producing a first nozzle-clearing preliminary ejection of ink from said nozzle for a first given period of time during said predetermined period of time responsive to said detection signal from said detecting means, and means for then producing a second preliminary ejection of ink for a second given period of time during said predetermined period of time in order to produce a steady ink flow from the nozzle, said first given period of time being much longer than said second given period of time;

said deflection means being responsive to outputs of said detecting means and said preliminary ejection means for deflecting said preliminarily ejected ink droplets to said ink collector during said predetermined period of time;

said printing operation being carried out after the expiration of said predetermined period of time.

3,925,790

IMAGE GENERATOR HAVING A PLURALITY OF MARKER UNITS OPERATED IN A PREDETERMINED SEQUENCE TO INHIBIT THE FORMATION OF PATTERNS

Kenneth Henry Fischbeck, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

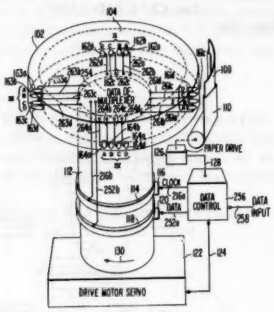
Filed Apr. 25, 1974, Ser. No. 463,996

Int. Cl.[2] G01D *15/18*

U.S. Cl. 346—140 **7 Claims**

1. A printing apparatus for marking picture elements along a line of a recording medium comprising:

a plurality of substantially matched marking units, each of said marking units being operable in response to a control signal manifesting tonal information to mark said recording medium, marks made by each of said marking units being normally substantially indistinguishable from marks made by the other marking units, at least one of said marking units being subject to malfunction; and



means for sequentially coupling said control signals to successive ones of said marking units in accordance with a predetermined sequence wherein no marking unit marks adjacent picture elements in said line whereby the marks of any malfunctioning marking unit are distributed at spaced intervals along said line.

3,925,791

PATTERN PRINTING APPARATUS

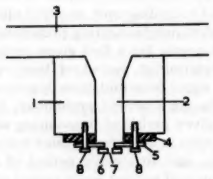
David Patrick Hunt, Cambridge, England, assignor to Imperial Chemical Industries Limited, London, England

Filed June 13, 1974, Ser. No. 479,178

Claims priority, application United Kingdom, June 13, 1973, 28169/73

Int. Cl.² G01D *15/18*

U.S. Cl. 346—140 **4 Claims**



1. An improved adjustable nozzle for pattern printing equipment having a plurality of printing guns each having a nozzle from which emerges a jet of printing liquid, the nozzle comprising:

a housing having interior walls defining an opening extending therethrough,

a plate member having a surface defining a plane and an opening extending therethrough, said plate member being adjustably mounted on said housing so that the opening in said plate member communicates with the opening in said housing,

a compressible member having an opening extending therethrough, said compressible member being positioned between said plate member and said housing such that the opening in said compressible member communicates with the opening in said housing,

a disc member having interior walls defining an opening extending therethrough, said opening having an axis through the center thereof and said disc member being positioned in contact with said plate member so that the opening in said disc member communicates with the opening in said plate member,

positioning means for holding said compressible member, said plate member and thereby said disc member on said housing, said positioning means being adjustable to move said plate member with respect to said housing thereby changing the degree of compression of said compressible member to move the plane defined by said plate member and moving the axis of said opening in said disc member whereby the direction of flow of printing liquid emerging from the opening in said disc member is alterable.

3,925,792

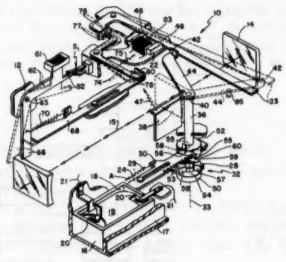
BATTERY TEST APPARATUS FOR USE IN A PHOTOGRAPHIC CAMERA

David E. Beach, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed June 17, 1974, Ser. No. 480,443

Int. Cl.² G03B *17/18*

U.S. Cl. 354—60 **6 Claims**



1. In a camera having a housing, apparatus for determining the operational status of a camera battery comprising:

a. an indicator member mounted within said housing and movable between a viewable position to indicate an unoperational battery condition and a nonviewable position, in which position an operational battery condition is indicated;

b. means for continuously urging said indicator member towards said viewable position;

c. electrical means energizable in a manner functionally related to the magnitude of the output voltage of a received battery, said electrical means having an output member operably associated with said urging means and mounted for concurrent movement therewith between a retaining position wherein said output member prevents said urging means from moving said indicator member from its nonviewable position and a released position wherein said urging means locates said indicator member in its viewable position, said output member being constructed and located to attain said retaining position in response to energization of said electrical means above a predetermined voltage level;

d. a manually operatable actuating member;

e. releasable latch means for maintaining said output member in said retaining position prior to energization of said electrical means;

f. control means responsive to operation of said actuating member for connecting the received battery to said electrical means and for releasing said latch means; and

g. means cooperating with said releasable latch means for permitting said output member to maintain said indicator member in its viewable position when the received battery is in an unoperational condition.

3,925,793

EYE FUNDUS CAMERA WITH FOCUS SETTING DEVICE

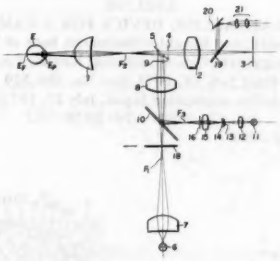
Isao Matsumura, Yokohama, and Yoshimi Kohayakawa, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 28, 1974, Ser. No. 455,945

Claims priority, application Japan, Mar. 31, 1973, 48-36215

Int. Cl.[2] G03B 29/00

U.S. Cl. 354—62 9 Claims



1. An eye fundus camera having a focus setting device, comprising:

photographing optics having an objective, a first reflection member, a first relay lens, and a photographing plane in said order from an eye to be inspected;

illuminating optics having a light source, a condenser lens, and a second relay lens for directing a beam onto an eye fundus through said first reflection member;

mark projection optics having a mark element, beam splitting means to separate the beam coming from said mark into a pair of beams, a beam diaphragm plate to limit each of said beams and an optical means for imaging the separated beams coming from said beam diaphragm plate; and a second reflection member being obliquely disposed on an optical axis of the first reflection member and the condenser lens of said illuminating optics to direct the beam from said mark projection optics into the illuminating optics;

wherein said photographing plane has a conjugate relationship with the imaging plane of the separated beams from the beam diaphragm plate in the mark projection optics, and wherein said beam diaphragm plate in the mark projection optics and the pupil plane of an eye to be inspected are in an imaging position relationship.

3,925,794

DEVICE FOR TAKING SEQUENCES OF AERIAL PHOTOGRAPHS

Aime Elie Alouges, Evry, France, assignor to Centre National d'Etudes Spatiales, Paris, France

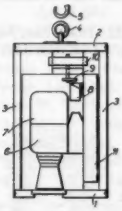
Filed Jan. 17, 1974, Ser. No. 434,135

Claims priority, application France, Jan. 17, 1973, 73.01611

Int. Cl.[2] G03B 29/00

U.S. Cl. 354—70 12 Claims

1. In combination with an aerial photography device fixed to a nacelle, and having at least one photographic apparatus arranged to be directed towards the ground when the nacelle is suspended from a balloon, a connection element for connecting the balloon with the nacelle, an element for controlling the taking of photographic exposures by the or each photographic apparatus and a mechanism for orienting the device about a vertical axis; an intervalometer for controlling the sequence of successive photographic exposures, a magnetometer for detecting the angular orientation of the nacelle in relation to the direction of the magnetic field of the Earth and means under control of the intervalometer and the magnetometer for initiating a photographic exposure taken by the or



each photographic apparatus when a predetermined angular orientation is reached.

3,925,795

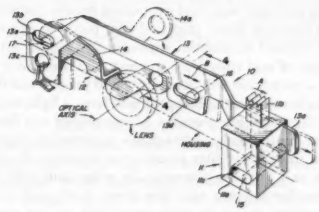
MECHANISM FOR CONTROLLING THE POSITIONING OF A DIAPHRAGM WITHIN A CAMERA

Walter A. Booth, Springfield, N.J., assignor to Berkey Photo, Inc., Paramus, N.J.

Filed Jan. 7, 1974, Ser. No. 431,480

Int. Cl.[2] G03B 15/03

U.S. Cl. 354—139 3 Claims



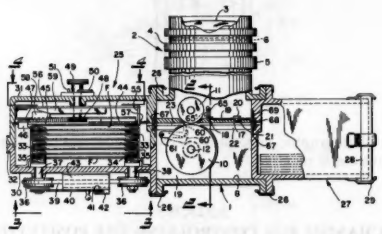
1. A mechanism of the type described for use on a camera having a housing provided with a film chamber, a lens positioned forwardly of and aligned with the film chamber, a manually activated shutter release for the lens, and a strobe light selectively responsive to the manual actuation of the shutter release; said mechanism comprising an on-off switch means mountable on the housing for manual movement between "on" and "off" positions and adapted to be operatively connected to the strobe light whereby the latter is energized upon actuation of the shutter release only when said on-off switch means is disposed in an "on" position, an apertured diaphragm adjustably mountable on the housing for movement between an operative position intermediate the film chamber and the lens whereby an aperture of the diaphragm is aligned with the optical axis of the lens, and an inoperative position wherein said diaphragm aperture is substantially out of registration with the lens, said diaphragm being provided with a first complemental portion spaced from said diaphragm aperture, an elongated link member adjustably mountable within the housing and carried by and movable in unison with said on-off switch means, said link member being provided with a second complemental portion in abutting engagement with said first complemental portion whereby movement of said switch means is directly transmitted to said iris to effect movement of the latter to either the operative or inoperative position, and resilient means mountable within the housing and being slidably engaged by a portion of the diaphragm and releasably retaining the latter in either said operative or inoperative position depending upon the relative position of said on-off switch means.

3,925,796

CAMERA APPARATUS FOR MAKING PHOTOGRAPHIC IMAGES ON MOVING CUT FILM PIECES

John J. Taylor, 539 S. San Marcos Road, Santa Barbara, Calif. 93111

Filed Aug. 22, 1973, Ser. No. 390,379
Int. Cl.² G03B *19/10*
U.S. Cl. 354—180 **10 Claims**



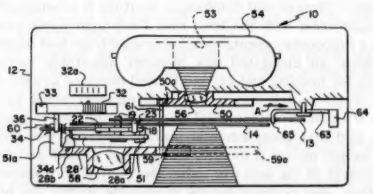
1. Camera apparatus for making a photographic image on a piece of cut photographic film while it is moving, comprising a body having an interior chamber; a lens mounted on said body and adapted to project an image into said chamber; means for guiding an individual cut film piece in a fixed path of travel in said chamber past said lens; means for propelling said individual film piece at a predetermined speed in said fixed path past said lens, said propelling means comprising two rolls that between them grip said film piece to propel it past said lens without substantial slippage, and means for rotating at least one of said rolls prior to entry of a film piece therebetween at a speed that will accelerate and propel said film piece at said predetermined speed past said lens; a light-tight supply chamber for storing a plurality of unexposed cut film pieces; means for sequentially individually positioning each of said individual unexposed film pieces in a substantially stationary condition at a location where it can enter said path of travel; and means for moving said film piece from said location to said propelling means so said propelling means can engage said film piece, accelerate it to said predetermined speed, and move said film piece in said path past said lens.

3,925,797

EXPOSURE CONTROL APPARATUS FOR A PHOTOGRAPHIC CAMERA HAVING INTERCHANGEABLE LENSES

Helmut Ettischer, Ruit, Germany, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 16, 1974, Ser. No. 515,273
Claims priority, application Germany, Sept. 26, 1975, 2352076
Int. Cl.² G03B *3/00*
U.S. Cl. 354—197 **8 Claims**



1. In a camera of the type having means adapted to locate lens apparatus having a plurality of focal lengths along a picture-taking axis, the improvement comprising:

a. means actuatable for selecting a particular lens apparatus having a predetermined focal length;

b. shutter means movable along a path between an initial, light-blocking position and a terminal, light-unblocking position for defining a varying progression of effective exposure apertures in registry with said axis as a function of the position of said shutter means along said path; and

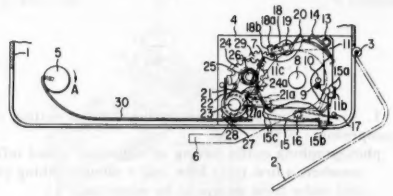
c. means responsive to selection of said particular lens apparatus for varying said terminal position of said shutter means.

3,925,798

FILM-ADVANCING DEVICE FOR A CAMERA

Noriaki Sanada, and Kanehiro Sorimachi, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed July 18, 1973, Ser. No. 380,229
Claims priority, application Japan, July 27, 1972, 47-75451
Int. Cl.² G03B *1/24*; B03B *1/62*
U.S. Cl. 354—215 **1 Claim**



1. A film advancing device for a camera using a magazine to accomodate a roll film therein, which comprises in combination:

supply spool means for winding the film out of the magazine and onto a supply spool of said means prior to phototaking;

means for taking up the film wound on said supply spool back into the magazine, said take-up means having a film take up lever, said take up lever being so arranged as to be able to control frame-by-frame movement of the film; film counter means movably operative in correspondence to the film winding operation of said supply spool and to the frame-by-frame movement of the film by said film take-up means;

means for locking said take-up means, said locking means being associated with and responsive to said film counter means to lock said take-up means against movement in the take-up direction prior to completion of an initial portion of said film winding operation and to release said take-up means after a predetermined length of the film is wound up on said supply spool; and

means for driving said film counter means in accordance with movement of said film, said driving means being so interlocked with the back cover of the camera as to be engaged and disengaged with said film counter means and to cause said film counter means to displace to a position where said driving means cannot drive the counter when said camera back cover is open.

3,925,799

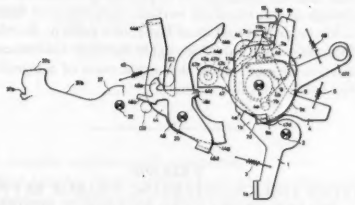
SHUTTER CONTROL ARRANGEMENT FOR CAMERAS

Atsutada Nakatani, Tokyo, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed Mar. 27, 1974, Ser. No. 455,512
Claims priority, application Japan, Mar. 28, 1973, 48-35191
Int. Cl.² G03B *9/08*
U.S. Cl. 354—235 **6 Claims**

1. A shutter mechanism for cameras comprising: a control lever arranged to be released from its locked condition by

shutter release operation, a front blade release lever engageable with said control lever and rotated by movement of said control lever, a front blade actuating lever engageable with said front blade release lever and released by movement of said front blade release lever to move front blades, a hold lever engageable with said control lever and rotated by movement of said control lever, a magnet lever engageable with said hold lever and rotatable by following rotation of said hold lever, a rear blade release lever engageable with said magnet lever and rotated by said magnet lever at the final stage of movement of said magnet lever, a rear blade actuating lever



engageable with said rear blade release lever and released by rotation of said rear blade release lever to move rear blades, a lock lever engageable with said magnet lever and capable of locking said magnet lever, an indication control lever engaging with said magnet lever and engageable with said control lever, and an indicating lever connected to said indication control lever, engagement of said magnet lever and lock lever being released by said front blade actuating lever at the final stage of movement of said front blade actuating lever, and said indicating lever being moved by said control lever through said indication control lever when said magnet lever is locked by said lock lever.

3,925,800

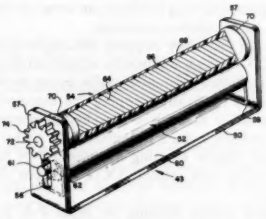
SPREAD ROLLER SYSTEM FOR SELF DEVELOPING TYPE PHOTOGRAPHIC APPARATUS

James M. Whall, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 2, 1974, Ser. No. 466,415

Int. Cl.[2] G03D 9/00

U.S. Cl. 354—301 **14 Claims**



1. Photographic apparatus including means for spreading a processing fluid in a layer between a pair of sheet elements, said spreading means comprising:

a first member having a first sheet-contacting surface; and

a second member mounted in juxtaposed relation to said first member and adapted to define a pressure generating gap therewith through which the sheet elements are adapted to be advanced during spreading of the processing fluid, said second member including a generally rigid support member having superimposed thereon a layer of resilient material having a longitudinally extending continuously varying thickness that cooperates with said support member to provide a second sheet-contacting surface having longitudinally extending variable deformation capability.

3,925,801

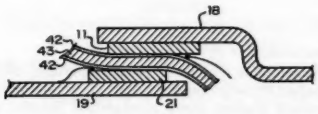
PHOTON ISOLATOR WITH IMPROVED PHOTODETECTOR TRANSISTOR STAGE

Roland H. Haitz, Portola Valley; Paul G. Sedlewicz, Menlo Park; Keith A. Stirrup, Los Altos; David F. Hilbiber, Los Altos Hills, and Robert W. Teichner, Palo Alto, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 408,033, Oct. 19, 1973, which is a continuation of Ser. No. 225,896, Feb. 14, 1972, abandoned. This application May 31, 1974, Ser. No. 475,216

Int. Cl.[2] H01L 33/00, 31/12, 31/16

U.S. Cl. 357—19 **1 Claim**



1. An optically coupled isolator comprising:

a semiconductor photon emitter and a semiconductor photon detector, said emitter and detector being mounted together in spaced-apart alignment; and

an isolating material comprising a lamination of a polymide film between two fluorinated ethylene-propylene copolymer films sandwiched between said emitter and detector for providing a selected spacing and electrical isolation therebetween.

3,925,802

SEMICONDUCTOR DEVICE

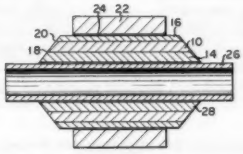
Jinzo Watanabe; Noboru Terao; Koichi Kamahara; Kazuhisa Miyashita, and Kenji Fujihira, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Feb. 21, 1974, Ser. No. 444,312

Claims priority, application Japan, Feb. 27, 1973, 48-23497; Feb. 15, 1974, 49-18797

Int. Cl.[2] H01L 29/06

U.S. Cl. 357—20 **6 Claims**

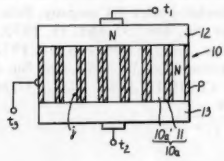


1. A semiconductor device comprising, a tubular substrate of semiconductor material with one type conductivity, an annular inner layer of semiconductor material of an opposite type conductivity internally of said tubular substrate defining a PN junction therebetween, a tubular conductive anode electrode bonded internally of said annular inner layer of semiconductor material and of greater axial length than said annular layer and said substrate, an N^+ type semiconductor annular outer layer circumferentially of said substrate defining an NN^+ junction therebetween, a tubular conductive cathode electrode circumferentially of the last-mentioned layer and of lesser axial length, and the substrate and inner and outer layers having bevelled outer edges defining in axial cross-section two frusto-conical configurations each having a base on a side opposite the longitudinal axis of the anode electrode.

3,925,803
ORIENTED POLYCRYSTAL JFET

Isamu Kobayashi, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed July 12, 1973, Ser. No. 378,449
Claims priority, application Japan, July 13, 1972, 47-70225
Int. Cl.² H01L *21/365, 29/80*
U.S. Cl. 357—22 **6 Claims**



1. A semiconductor device comprising:

A. a polycrystalline region comprising a plurality of slender, rod-shaped semiconductor crystals grown simultaneously in a closely packed group substantially parallel to each other and having grain boundaries therebetween, said crystals being of one conductivity type;

B. a sheath comprising an impurity layer of the opposite conductivity type along the length of each of said crystals to form, with the central crystalline material of the respective rod-shaped crystal, a P-N junction;

C. a first electrode connected to one end of said crystals;

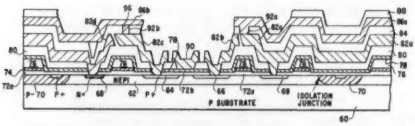
D. a second electrode connected to said sheath;

E. a third electrode connected to the other end of said crystals.

3,925,804
STRUCTURE OF AND THE METHOD OF PROCESSING A SEMICONDUCTOR MATRIX OR MNOS MEMORY ELEMENTS

James Ronald Cricchi, Baltimore, and Barry W. Ruehling, Belair, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 29, 1974, Ser. No. 437,650
Int. Cl.² H01L *29/78, 29/34*
U.S. Cl. 357—23 **15 Claims**



1. A semiconductive structure comprising:

a. a semiconductive member of a first conductivity type, having a surface;

b. first and second regions disposed within said surface of said semiconductive member and formed of a second conductivity type material opposite to that of said first conductivity type, said first and second regions being spaced from each other and defining a second portion of said surface of said semiconductive member;

c. a first silicon oxide layer disposed over a first, further portion of said surface of said semiconductive member;

d. a second silicone oxide layer disposed to cover said second portion of said surface;

e. third and fourth layers of silicon nitride or aluminum oxide deposited respectively over said first and second silicon oxide layers;

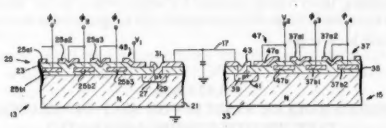
f. a first conductive element disposed in intimate electrical contact with that portion of said fourth nitride layer covering at least a part of said semiconductive member intermediate said first and second regions, thus permitting the formation of a channel therebetween in response to the application of a signal to said first conductive element, said fourth layer being deposited at a rate and at a temperature to provide a minimal interface charge at the interface surface between said second silicon oxide layer and said fourth layer; and

g. a second conductive element disposed through a window within said second silicon oxide layer and said fourth layer to form an intimate electrical contact with one of said first and second regions of said member and disposed to overlie said third layer, said third layer deposited at a rate and at a temperature to provide a maximum interface charge at the interface surface between said first silicon oxide layer and said third layer, of a polarity to inhibit the formation of a parasitic region beneath said second conductive element upon the application of a signal to said second conductive element.

3,925,805
SYSTEM FOR TRANSFERRING CHARGE BETWEEN SPACED APART CCDS BY DIRECT SERIES CONNECTION

Darrell M. Erb, Newport Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jan. 28, 1974, Ser. No. 437,422
Int. Cl.² H01L *29/78*
U.S. Cl. 357—24 **14 Claims**



1. A system for coupling charge from a sending CCD to a receiving CCD, each CCD having distributed along the surface of a semiconducting substrate an array of charge handling electrodes, said system comprising:

a. means for cyclically stepping the electrodes of said sending CCD through a plurality of potentials so as to intermittently induce potential wells under them;

b. means for cyclically stepping the electrodes of said receiving CCD through a plurality of potentials so as to intermittently induce potential wells under them;

c. a doped region forming an output P-N junction in the substrate of said sending CCD adjacent one of its electrodes;

d. a doped region forming an input P-N junction in the substrate of said receiving CCD adjacent one of its electrodes;

e. an output coupling electrode in said sending CCD intermediate said one of its electrodes and said doped region adjacent thereto;

f. an input coupling electrode in said receiving CCD between said one of its electrodes and said doped region adjacent thereto;

g. means for directly interconnecting said doped regions; and

h. means for maintaining respective ones of said output coupling electrode and said input coupling electrode at first and second preselected potentials relative to said substrates.

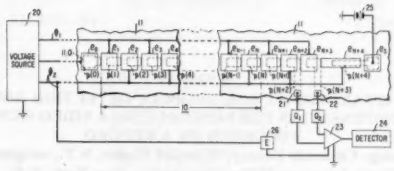
3,925,806
TRANSFER FILTER FOR TRANSFER DEVICES

Robert Joseph Strain, North Indialantic, Fla., and Karvel Kuhn Thornber, Berkeley Heights, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 373,269, June 25, 1973, abandoned. This application Nov. 29, 1974, Ser. No. 528,030

Int. Cl.² H01L *29/78*

U.S. Cl. 357—24 **11 Claims**



1. A transfer device which comprises:

a. a first transfer device section having N successive transfer stages for transferring a transfer signal entity in a transfer direction from stage to stage sequentially;

b. a second transfer device section, responsive to the output of the first transfer device section, having at least two transfer stages of which one stage has a coefficient of incomplete transfer which is within 50 percent of the sum of the coefficients of incomplete transfer in all transfer stages in the first and second sections previous in the transfer direction to the said one stage.

3,925,807
HIGH VOLTAGE THYRISTOR

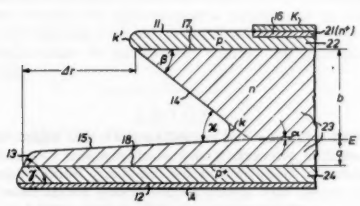
Alois Sonntag, Muhlheim, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Nov. 26, 1974, Ser. No. 527,396

Claims priority, application Germany, Nov. 27, 1973, 2358937

Int. Cl.² H01L *29/06*

U.S. Cl. 357—55 **3 Claims**



1. In a thyristor for operation at high voltages and including: a fully diffused, generally cylindrical semiconductor element having two opposed end surfaces defining major surfaces of the element, the major surfaces being of respectively different radii, and the element further having a conically tapered edge surface extending between the major surfaces, the element being composed of a plurality of semiconductor regions of alternatingly opposite conductivity types defining pn-junctions lying in planes essentially parallel to the major surfaces, one of the semiconductive regions being bounded by first and second ones of the pn-junctions, the first one of the pn-junctions being arranged to be reverse-biassed in the forward conducting direction of the thyristor, and the first and second ones of the pn-junctions having respectively different radii; and two electrodes each contacting a respective major surface; the improvement wherein: the circumference of at least part of said one semiconductive region is radially constricted and is defined by two surface portions lying in conical planes sloping radially inwardly toward one another and intersecting at an intersection plane parallel to said pn-junctions; one of said surface portions intersects said first one of said junctions and extends substantially to the smaller one of said major surfaces; the other of said surface portions extends to said tapered edge surface and is located entirely between said first and second ones of said junctions so as to not intersect any pn-junction; the angle between said one of said surface portions and said first one of said junctions is larger than the angle between said other of said surface portions and said intersection plane; the distance between said first one of said junctions and said intersection plane is greater than the distance between said second one of said junctions and said intersection plane; and the distance between said first one of said junctions and said second one of said junctions is smaller than the difference between the radii of said first and second ones of said junctions.

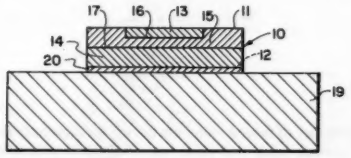
3,925,808
SILICON SEMICONDUCTOR DEVICE WITH STRESS-FREE ELECTRODES

Prosenjit Rai-Choudhury, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 8, 1974, Ser. No. 495,755

Int. Cl.² H01L *23/48, 29/44*

U.S. Cl. 357—67 **9 Claims**



1. A silicon semiconductor device comprising:

A. a silicon semiconductor body having opposed major surfaces and containing impurity regions of different conductivity types to impart given electrical characteristics to the device;

B. at least one electrode of silicon doped therethrough to an impurity concentration of greater than about 1×10^{19} atoms/cm^3; and

C. at least one solder layer, said solder layer being disposed between and bonding together the silicon body and the electrode of silicon in intimate electrical and mechanical contact, said solder layer formed by alloying a solder material with the silicon body and the electrode of silicon, said device being so constructed and arranged that at least one of the opposed major surfaces of the silicon body is in its entirety in intimate contact with the electrode of silicon.

3,925,809
SEMI-CONDUCTOR RECTIFIER HEAT SINK

David L. Striker, Plymouth, Mich., assignor to Ford Motor Company, Dearborn, Mich.

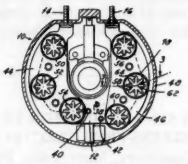
Continuation of Ser. No. 379,136, July 13, 1973, abandoned. This application Feb. 4, 1975, Ser. No. 546,965

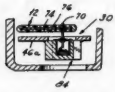
Int. Cl.² H01L *23/02*

U.S. Cl. 357—81 **7 Claims**

1. In a semi-conductor rectifier assembly for a polyphase AC alternator of the type having a plurality of semi-conductor diode members equal in number to twice the number of electrical phases in the alternator output, each of the diode members having a cathode electrode and an anode electrode, electrical circuit means interconnecting selected pairs of the diode members with the phases of the alternator output such that the cathode electrodes of the first diode member of a diode pair and the anode electrode of the second diode member of a diode pair are electrically common and are connected

to receive a phase of the alternator output, and further electrical circuit means interconnecting the anode electrodes of the first diode members of the diode pairs and interconnecting the cathode electrodes of the second diode members of the diode pairs for producing a rectified DC output wherein the further electrical circuit means comprise first and second heat dissipating plate members having a generally uniform thickness in a first direction, the first plate member being electrically common with the anode electrodes of the first diode members of the diode pairs and the second plate member being electrically common with the cathode electrodes of the second diode members of the diode pairs, the improvement comprising:





a plurality of finned elements having fin members in thermal contact with the plate members and extending away therefrom in the first direction with said fin members extending away from the finned elements in a direction transverse to the first direction;

each of said diode members being arranged to be in thermal contact with one of the finned elements; and

a plurality of apertures defining air flow passages extending through the first and second plate members in proximity to said fin members to facilitate air flow over said fin members.

3,925,810

MAGNETIC RECORDING AND/OR REPRODUCING SYSTEM

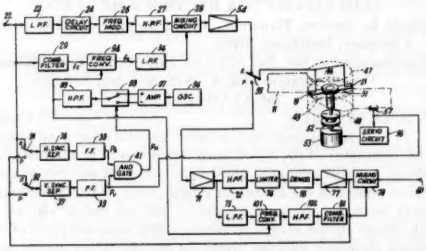
Yoshio Ishigaki; Hisaaki Narahara, both of Tokyo, and Takao Tsuchiya, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 21, 1975, Ser. No. 542,697

Claims priority, application Japan, Jan. 21, 1974, 49-9160

Int. Cl.² H04N 5/79

U.S. Cl. 358—4 **5 Claims**



1. Apparatus in which video signals are recorded in *h*-alignment in adjacent tracks on a recording medium, said apparatus comprising:

A. means for generating a frequency converting carrier signal in first and second versions of opposite polarity;

B. a frequency converter to receive chrominance components of said video signals; and

C. means to apply said first and second versions of said carrier signal in a predetermined sequence to said frequency converter, said sequence being such that, during alternate tracks, only one of said versions is applied and, during the remaining alternate tracks, said first and second versions are applied alternately in successive line intervals.

3,925,811

APPARATUS HAVING DROPOUT DETECTION AND COMPENSATION FOR REPRODUCING A VIDEO SIGNAL RECORDED ON A RECORD

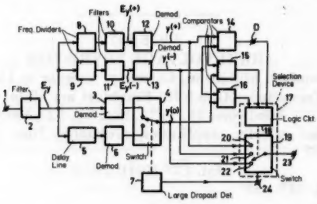
George Churchill Kenney, Briarcliff Manor, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Feb. 14, 1974, Ser. No. 442,354

Claims priority, application Netherlands, Aug. 7, 1973, 7310869

Int. Cl.² H04N 5/76, 9/02

U.S. Cl. 358—8 **6 Claims**



1. An apparatus for reproducing a video signal which is recorded on a record carrier which contains a carrier which is frequency modulated by the luminance information of the video signal, said apparatus comprising a first filter having input means for receiving said recorded signal and an output, a first and a second frequency divider, each having an input coupled to said first filter output such that each divider provides a signal of lower frequency than said recorded signal, the first frequency divider having output means for supplying a first lower frequency signal whose consecutive zero crossings correspond to the zero crossings of the rising edges of the modulated carrier, the second frequency divider having output means for supplying a second lower frequency signal whose consecutive zero crossings correspond to the zero crossings of the falling edges of said modulated carrier, a first frequency demodulator means coupled to said first divider output means for demodulating the first lower frequency signal, a second frequency demodulator means coupled to said second divider output means for demodulating the second lower frequency signal, and a first comparator means coupled to said demodulator output means for comparing the demodulated first and second lower frequency signals, said comparator means having an output means for supplying an output signal which indicates the occurrence of a signal dropout.

3,925,812

COLOUR TELEVISION CAMERA INCLUDING A POSITION CORRECTOR FOR AT LEAST TWO SCANNING RASTERS IN THE CAMERA

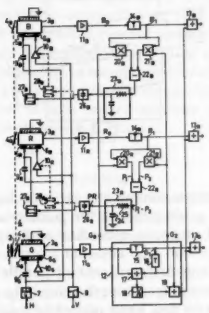
Hendrik Blom, and Prudent Eduardus Jacobus Mollet, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 2, 1972, Ser. No. 249,527

Claims priority, application Netherlands, May 6, 1971, 7106184

Int. Cl.² H04N *9/08*

U.S. Cl. 358—51 **7 Claims**



1. A circuit for registering a first scanning raster onto a second scanning raster, said circuit comprising a position corrector means having a pair of inputs for receiving video signals representative of said rasters respectively and an output means for supplying an error signal in accordance with any differences in registration between said rasters; means for eliminating high frequency components from said error signal comprising an integrator having an input coupled to said output means, and an output, and having a time constant at least substantially equal to one field period; and a store having an input coupled to said integrator output and an output means for applying a signal to a deflection means whereby said registration is performed without high frequency distortion.

3,925,813

OPTICAL SYSTEM FOR COLOR TELEVISION CAMERA

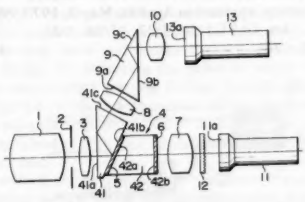
Seiji Toyama, Kawaguchi; Kazuo Yoshikawa, Omiya, and Takeshi Higuchi, Tokyo, all of Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Feb. 5, 1974, Ser. No. 440,139

Claims priority, application Japan, July 2, 1973, 48-73648

Int. Cl.² H04N *9/04*

U.S. Cl. 358—55 **15 Claims**



1. An optical system for a double tube color television camera comprising an afocal objective lens component, a color separating optical means located behind said objective lens component for dividing the light incident thereto into first light carrying first color image information and second light carrying second color image information, a first focussing lens system located behind the color separating optical means for focussing said first light on a first image pickup tube of the camera, a second focussing lens system located beside the color separating optical means for focussing said second light on a second image pickup tube of the camera, and a light deviating means provided in said second focussing lens system for directing the second light in the direction parallel to the optical path of said first light.

3,925,814

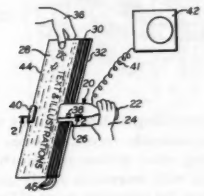
SOUND CARD AND SOUND APPARATUS SUITABLE FOR MULTI-CHANNEL USE

Maurice E. Chernowitz, 91 Payson Ave., New York, N.Y. 10034

Continuation-in-part of Ser. No. 103,589, Jan. 4, 1971, Pat. No. 3,767,208. This application Aug. 23, 1973, Ser. No. 390,748. The portion of the term of this patent subsequent to Oct. 23, 1990, has been disclaimed.

Int. Cl.² G11B *25/04, 15/12, 5/12*

U.S. Cl. 360—2 **9 Claims**

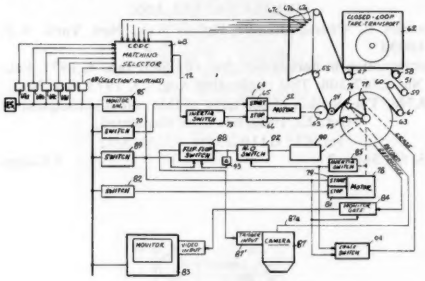


1. Audio apparatus having a card with a substantially straight longitudinal edge along one side thereof, a sound track on the card extending parallel to said edge and including a plurality of sub-channels thereon, a frame having a portion that is shaped to fit the grip of one hand of an operator holding it during use, a channel shaped guideway at one end of the frame facing away from the portion that is gripped in one hand, said channel shaped guideway having top and bottom guide surfaces having portions that extend to the end of the frame remote from the grip portion and that covers the portion of the card inward from said longitudinal edge, including the sound track, and with a mid-surface of the guideway between the top and bottom guide surfaces thereof in angular relation to the top and bottom guide surfaces and with which said longitudinal edge of the card contacts to guide the card during relative movement of the card and frame lengthwise of the sound track, the guideway being substantially shorter than the card in the direction of relative movement of the card and guideway, a sound head carried by the frame with a portion that projects through the top guide surface of the guideway into working relation with the sound track when the edge of the card is against the mid-surface of the channel, the card being substantially greater in width than the part that extends into the guideway whereby most of the card is visible beyond the guideway and there is a wide card area beyond the end of the guideway that can be gripped by the other hand of an operator who is holding the grip portion with his first hand, the sound head having different contacts that operate along the different sub-channels of the sound track, and switch means operable into different positions to make different contacts effective.

3,925,815
VIDEO TRANSDUCING APPARATUS AND METHOD FOR EDITING

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 225,173, Aug. 27, 1962, which is a continuation-in-part of Ser. No. 668,348, June 27, 1957, Pat. No. 3,051,777, which is a continuation-in-part of Ser. No. 515,417, June 14, 1955, Pat. No. 3,003,109. This application Jan. 14, 1974, Ser. No. 432,906
Int. Cl.[2] G11B 27/02
U.S. Cl. 360—14 10 Claims



1. A method of recording and reproducing video information relative to an eraseable record member by selectively erasing and replacing video picture signals which have been previously recorded with respective newly generated video signals recorded along the recording areas of the record member from which said previously recorded signals have been erased, comprising:

generating a plurality of full-frame video picture signals and recording said full-frame video picture signals on respective frame recording areas of an eraseable record member,

thereafter replacing a selected portion of the recorded full-frame video signals with respective new full-frame video picture signal recordings by:

scanning said record member by relatively moving it and a plurality of transducers including a recording transducer which is operable for recording video signals and an erasing transducer which is normally deactivated and may be selectively operable for erasing selected of the recorded video signals,

generating a pulse signal each time a full-frame video picture signal recording on said record member is scanned by said recording transducer whereby said pulse signals define respective frame position indicating marker pulses, initiating a recording control function by passing the marker pulses so generated to a counter control means to cause the uncounting thereof upon receipt by said counter control means of a predetermined number of said marker pulse signals,

generating a control signal when said counter control means uncounts and applying said control signal to activate and energize said erasing transducer to initiate erasure of a selected portion of the recorded video information,

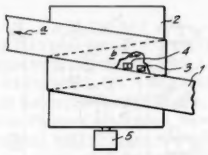
generating new full-frame video picture signal information, and

also applying said control signal to control the transmission of the newly generated full-frame video picture signal information to said recording transducer so as to initiate the recording of new video information on that portion of the eraseable record member along which erasure was effected by said erasing transducer.

3,925,816
MAGNETIC RECORDING SYSTEM WITH OVERLAPPING TRACKS OF HIGH AND LOW FREQUENCY INFORMATION

Nobutoshi Kihara, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 840,283, July 9, 1969, abandoned. This application July 2, 1973, Ser. No. 375,465
Claims priority, application Japan, July 10, 1968, 43-48254
Int. Cl.[2] H04N 5/79
U.S. Cl. 360—19 2 Claims

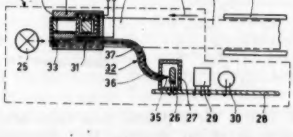


1. In a magnetic recording and reproducing apparatus, the combination of guiding means for guiding a magnetic tape, first and second magnetic recording and reproducing heads moved relative to said tape adjacent a surface of the tape for respectively tracing first and second parallel tracks on said tape with said second track overlapping only a portion of said first track with said first head preceding said second head in the relative movement of said hands with respect to said tape, said second head having a core gap extending transversely at right angles to the longitudinal direction of said second track, said first head having a core gap that is substantially wider than the core gap of said second head and extending transversely across said first track at an acute angle with respect to the direction of said core gap of the second head, recording circuit means operable to apply a first signal to said first head for recording by the latter in said first track to a substantial depth in said tape from said surface of the latter and to apply to said second head a second signal having a substantially higher frequency than said first signal for recording of said second signal in said second track only adjacent said surface of the tape, whereby said second signal erases only so much of said first signal as appears adjacent said surface of the tape in the overlapping portions of said first and second tracks, and reproducing circuit means operable to cause said first and second heads to reproduce said first and second signals recorded in said first and second tracks, respectively, at a substantial depth from said surface and adjacent said surface, respectively.

3,925,817
OPTICAL DRIVE CONTROL WITH HEAD MOUNTED LIGHT GUIDE MEANS

Horst Althuber, and Karl Rupp, both of Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 24, 1974, Ser. No. 463,675
Claims priority, application Austria, May 3, 1973, 3893/73
Int. Cl.[2] G11B 15/22, 15/08, 5/22
U.S. Cl. 360—74 4 Claims



1. A magnetic recording and/or playback apparatus for recording and/or playing back information on magnetic tape,

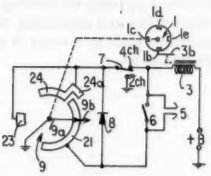
comprising a magnetic recording and/or playback head, a magnetic erase head, at least one of said magnetic heads being provided with a curved surface, said record carrier abutting a substantial area of the curved surface of said one of said magnetic heads, motor means for selectively driving said record carrier past said magnetic heads in the forward and reverse directions, a light source mounted opposite said one of said heads, said record carrier being provided with opaque magnetically recorded areas and transparent control areas, a photosensitive element, a light shield surrounding said photosensitive element, a light guide means in said one of said heads for optically connecting the area of the curved surface of said one of said heads that abuts said record carrier to said photosensitive element through said light shield whereby radiation from said light source is conducted to said photosensitive element when said transparent control portion of said record carrier is interposed between said light guide means and said light source, and drive control means connected to said photosensitive element and to said motor means for selecting the direction of motion of said record medium in response to signals from said photosensitive element.

3,925,818

HEAD SHIFTING MECHANISM FOR TWO-CHANNEL AND FOUR-CHANNEL CARTRIDGE TAPE RECORDER

Kumeo Tahara, Iwaki, Japan, assignor to Alps Motorola, Inc., Tokyo, Japan

Filed Aug. 1, 1974, Ser. No. 493,941
Claims priority, application Japan, Aug. 2, 1973, 48-91452
Int. Cl.² G11B *5/55, 21/08*
U.S. Cl. 360—106 **6 Claims**



1. A magnetic head shifting mechanism for a cartridge-type tape player adapted to receive and play two-channel and four-channel tape cartridges and including a changeover switch mechanism between a first position when a two-channel tape cartridge is inserted into the player and a second position when a four-channel tape cartridge is inserted into the player, including in combination:

magnetic tape head means having four pick-up areas,

head shifting cam means mounted to the player and engageable with said tape head means, said cam means being rotatable between first, second, third and fourth levels to align said pick-up areas with selected tracks on the tape, drive means coupled to said cam means for rotating said cam means between said first, second, third and fourth levels,

rotary switch means including a rotary contactor portion coupled to said cam means and a contact portion having first, second, third and fourth contacts coupled to said drive means for actuating the same to rotate said cam means, the contact portion further including means for aligning the contacts with respect to the contactor such that a selected sequential one of the contacts is in electrical engagement with the contactor as the contactor is rotated, and

manual switch means coupled to said drive means and to said rotary switch means for energizing said drive means to rotate said cam means when the changeover switch mechanism is in the second position,

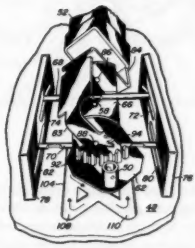
said rotary contact portion and said first and fourth contacts being constructed to continuously energize said drive means as said contactor portion moves from said fourth contact to said first contact when the changeover switch is in the second position and said manual switch means has been actuated to energize said drive means to rotate said cam means to successive levels to thereby align said pick-up areas with selected tracks on the tape.

3,925,819

TAPE HEAD ROTATOR MECHANISM FOR TRACK CHANGING

Mario E. Bachmann, Chicago, Ill., assignor to Motorola, Inc., Chicago, Ill.

Division of Ser. No. 333,411, Feb. 16, 1973, Pat. No. 3,855,628. This application Aug. 5, 1974, Ser. No. 491,027
Int. Cl.² G11B *5/54, 5/55, 21/08*
U.S. Cl. 360—106 **6 Claims**



1. A tape head rotator mechanism for a multitrack tape comprising

a tape head having a pickup portion, the pickup portion located on the tape head so that it is aligned with at least one track when the tape head is in a first position and aligned with at least one different track when the tape head is in a second position rotated 180° relative to the first position,

a movable carriage,

a base plate,

means mounting the carriage on the base plate for sliding movement between a forward position engaging the tape head with the tape and a rearward position disengaging the tape head from the tape,

means for moving the carriage between the said positions, and

means for rotating the tape head 180° when the carriage is moved in a cycle from the forward to the rear position and returned to the forward position including

a frame supporting the tape head, means mounting the frame to permit 180° rotation of the frame and tape head relative to the carriage,

a second plate,

means mounting the second plate to the carriage to provide for movement of the second plate in an arcuate path transverse the path of movement of the carriage,

pinion and gear rack means mounted between the frame and the second plate for rotating the frame and tape head 180° and

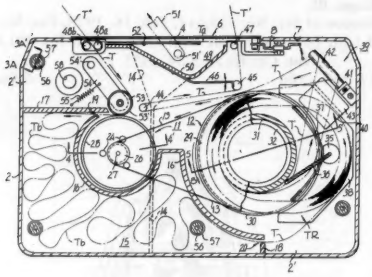
means for moving the second plate relative to the carriage in said accurate path responsive to the carriage being moved from the first position to the second position and back to the first position to effect the desired 180° rotation through the pinion and gear rack means.

3,925,820

ENDLESS LOOP TAPE CARTRIDGE FOR USE WITH TAPE EXTRACTION SYSTEMS

Hanjiro Esashi, Sendai, and Shuji Yoshizaki, Tagajyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 390,864, Aug. 23, 1973, abandoned.
This application Nov. 22, 1974, Ser. No. 526,395
Claims priority, application Japan, Aug. 24, 1972, 47-98834[U]
Int. Cl.[2] G11B *23/04*; B65H *17/48*
U.S. Cl. 360—132 10 Claims



1. An improved tape cartridge comprising a housing having an access opening and partition means dividing the interior of the housing into a main compartment which opens to the exterior of the housing at said access opening and a storage compartment which communicates with said main compartment at an entry and an exit defined by said partition means, an endless loop of tape having its major portion wound to form a coil, means rotatably supporting said coil within said main compartment, a drive roller rotatably mounted within said main compartment adjacent said entry to the storage compartment and adapted to be rotated from the exterior of said housing, guide means within said housing including guide members adjacent the opposite sides of said access opening for guiding said tape in a run that extends from the innermost winding of said coil across said access opening and from the latter into said entry of the storage compartment and out of said exit of the latter back to the outermost winding of said coil, a substantial portion of said run of the tape being normally disposed in loose serpentine folds within said storage compartment, the tape in said run between said guide members being withdrawable from said housing through said access opening for the recording and reproducing of signals on the withdrawn tape at the exterior of said housing, a freely rotatable pinch roller in said main compartment adjacent said drive roller, means supporting said pinch roller for movement of the latter generally toward and away from said drive roller, said pinch roller engaging said run of the tape at the portion thereof between one of said guide members and said entry to the storage compartment and forming a bend in said portion of the tape run with the tape between said one guide member and said pinch roller being directed so that tension therein tends to move said pinch roller away from said drive roller and with the tape engaged by said pinch roller facing toward said drive roller, and spring means yieldably urging said pinch roller against said drive roller for driving by the latter of the tape therebetween into said entry of the storage compartment, the force of said spring means being selected to be overcome by an increased tension in said tape between said one guide member and said pinch roller in response to the withdrawal of tape through said access opening for moving said pinch roller away from said drive roller and permitting the tape constituting said loose serpentine folds to run out of said storage compartment through said entry.

DESIGN PATENTS

GRANTED DECEMBER 9, 1975

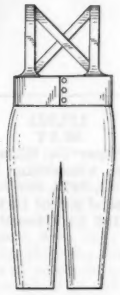
ERRATA

For CLASS	See PATENT NO.
019–097	238,005

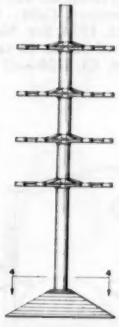
DESIGNS

DECEMBER 9, 1975

237,914
TROUSERS
Granville W. Anderson, 27694 Mound Road, Warren, Mich. 48089
Filed May 31, 1974, Ser. No. 474,930
Term of patent 7 years
Int. Cl. D2—*02*
U.S. Cl. D2—28

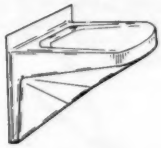


237,915
DISPLAY STAND
Lester V. Molenaar, Box 777—West Highway 40, Willmar, Minn. 56201
Filed May 6, 1974, Ser. No. 467,493
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—23

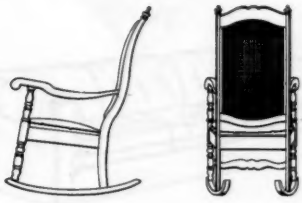


237,916
COLLAPSIBLE CHAIR
Burkhard Mleinik, Untergruppenbach, Germany, assignor to Rudolf Baresel-Bofinger
Filed June 26, 1974, Ser. No. 483,384
Claims priority, application Germany Feb. 12, 1974
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—37

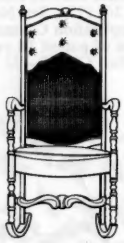
237,917
WALL MOUNTED SEAT
Merritt W. Seymour, Sylvania, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Filed Nov. 21, 1972, Ser. No. 308,356
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—47



237,918
ROCKING CHAIR
Richard Morse Chapin and Hamlin Taylor Haynes, Charlotte, N.C., assignors to Paoli Chair Company, Inc., Paoli, Ind.
Filed Aug. 5, 1974, Ser. No. 495,048
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—49

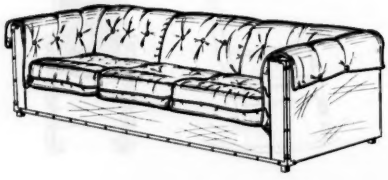


237,919
ROCKING CHAIR
Richard Morse Chapin and Hamlin Taylor Haynes, Charlotte, N.C., assignors to Paoli Chair Company, Inc., Paoli, Ind.
Filed Aug. 5, 1974, Ser. No. 495,050
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—49



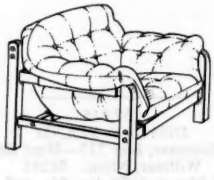
237,920
CHAIR
Charles Bernard, Montreuil-sous-Bois, France, assignor to Airborne, S.A.
Filed Mar. 20, 1972, Ser. No. 236,567
Claims priority, application France Sept. 22, 1971
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—56

237,921
FURNISHING ELEMENT
Burton H. Kaplan, Potomac, Md., assignor to Rowe Furniture Corporation, Salem, Va.
Filed Sept. 17, 1974, Ser. No. 506,842
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



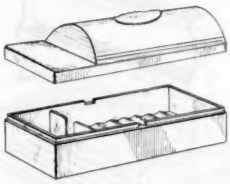
237,922
CHAIR
Henry C. Pedersen, 4807 E. Jackson Road, Elkhart, Ind. 46514
Filed Mar. 25, 1974, Ser. No. 454,060
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—68

237,923
SEAT
Thomas Winrow, Naperville, Ill., assignor to Futorian Corp,. Amsterdam, N.Y.
Filed Dec. 13, 1974, Ser. No. 532,570
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—73



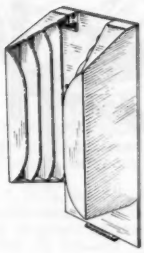
237,924
DISPLAY RACK
Aaron I. Friedman, 425 2nd St., San Francisco, Calif. 94107
Filed July 12, 1974, Ser. No. 488,146
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—85

237,925
COMBINED SOAP BAR CONTAINER AND COVER THEREFOR
Tedd Theodore Thomas, New Canaan, Conn., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed May 16, 1974, Ser. No. 470,454
Term of patent 14 years
Int. Cl. D9—*03*; D23—*02*
U.S. Cl. D6—89

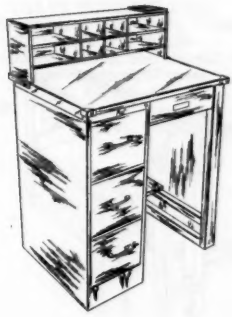


237,926
COMBINED SOAP DISH, TOOTHBRUSH HOLDER, AND TUMBLER
Barbara Adler Katzander, New York, N.Y., assignor to Joseph A. Kaplan & Sons, Inc., Yonkers, N.Y.
Filed Feb. 27, 1975, Ser. No. 553,755
Term of patent 14 years
Int Cl. D23—*02*
U.S. Cl. D6—91

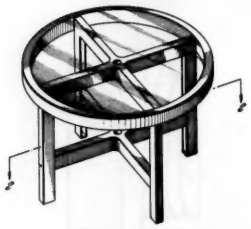
237,927
BOOK HOLDER AND SUPPORT FOR TELEPHONE DIRECTORIES AND THE LIKE
Donald G. King, 241 Dickson Park Crescent, Mississauga, Ontario, Canada
Filed May 6, 1974, Ser. No. 467,444
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—114



237,928
SHOP DESK OR SIMILAR ARTICLE
Eugene R. Kent, Lombard, Ill., assignor to Draik Midwest Company, Inc., Oak Brook, Ill.
Filed Nov. 27, 1974, Ser. No. 527,756
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—162



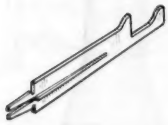
237,929
DINING TABLE OR THE LIKE
Harry Laylon, Syracuse, N.Y., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Jan. 7, 1974, Ser. No. 431,445
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—175



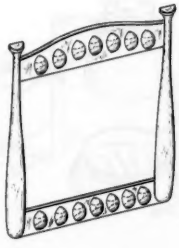
237,930
CHILD'S WORKBENCH
Darwin L. Demmer, 379 Perkinswood SE., Warren, Ohio 44483
Filed June 13, 1973, Ser. No. 369,443
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—179

237,931
KITCHEN ISLAND TABLE
Carl Brandenfels, 102 SE. Santosh, Scappoose, Oreg. 97056
Filed June 24, 1974, Ser. No. 482,318
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—179

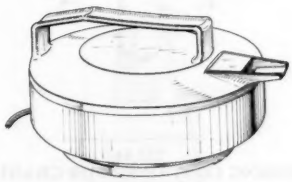
237,932
EYEGLASS DISPLAY SUPPORT POST
Richard S. Dunchock, Northville, Mich., assignor to Optarac Corporation, Ferndale, Mich.
Filed Aug. 19, 1974, Ser. No. 498,543
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191



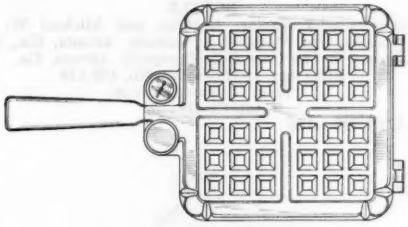
237,933
MIRROR OR PICTURE FRAME
Oliver Farley, 1428 Sterling Place, Brooklyn, N.Y. 11213
Filed Apr. 5, 1973, Ser. No. 348,369
Term of patent 7 years
Int. Cl. D6—*07*
U.S. Cl. D6—244



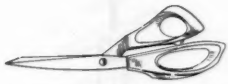
237,934
ELECTRIC TEA KETTLE
Victor L. Fairthorne, Willowdale, Ontario, Canada, assignor to Westinghouse Canada Limited
Filed Mar. 4, 1974, Ser. No. 447,757
Claims priority, application Canada Oct. 29, 1973
Term of patent 7 years
Int. Cl. D7—*02*
U.S. Cl. D7—62



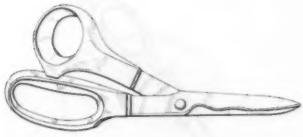
237,935
WAFFLE IRON
Donald W. Nygren, Minneapolis, Minn., assignor to Northland Aluminum Products, Inc., Minneapolis, Minn.
Filed Mar. 25, 1974, Ser. No. 454,215
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—88



237,936
SCISSORS
Alfred W. Wakeman, Durham, Conn., assignor to The Risdon Manufacturing Company, Naugatuck, Conn.
Filed Oct. 11, 1973, Ser. No. 405,576
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—57



237,937
KITCHEN SCISSORS
Olof Fredrik Bäckström, Tammisaari, and Erkki Olavi Lindén, Billnas, Finland, assignors to Oy Fiskars Ab, Helsinki, Finland
Filed Jan. 3, 1974, Ser. No. 430,443
Claims priority, application Finland Nov. 28, 1973
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—57



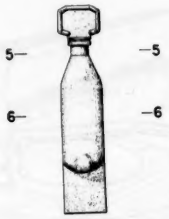
237,938
VALVE PULLING TOOL
Ezekiel Seminario, 15500 Tustin Village Way, Tustin, Calif. 92680
Filed Dec. 21, 1973, Ser. No. 427,207
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—59

237,939
VALVE CORE EXTRACTION TOOL
Ezekiel Seminario, 15500 Tustin Village Way, Tustin, Calif. 92680
Filed Feb. 1, 1974, Ser. No. 438,556
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—59

237,940
VACUUM PICK-UP FOR WAFERS
T. John Trayes, Phoenix, Ariz., assignor to Motorola, Inc., Chicago, Ill.
Filed Mar. 28, 1974, Ser. No. 455,683
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—71

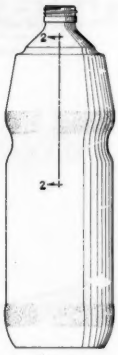
237,941
GOLF CART UMBRELLA MOUNT
William F. Dotter, 49 Spruce St., Smithtown, N.Y. 11787
Filed May 23, 1974, Ser. No. 472,622
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—235

237,942
DISPENSING CONTAINER
George W. Welker III, Downingtown, and Joseph E. Brady, West Chester, Pa., assignors to American Home Products Corp., New York, N.Y.
Filed July 25, 1974, Ser. No. 491,904
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—2



237,943
DISPENSING CONTAINER FOR GRANULATED MATERIAL
Alberto Alemagna, Milan, Italy, assignor to Alemagna S.p.A., Milan, Italy
Filed Apr. 8, 1974, Ser. No. 458,659
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—63

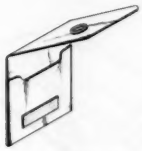
237,944
BOTTLE
Harvey Carter Taylor, Decatur, and Michael W. J. Godden, and Marshall J. Barrash, Atlanta, Ga., assignors to The Coca-Cola Company, Atlanta, Ga.
Filed Apr. 18, 1974, Ser. No. 459,138
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—100



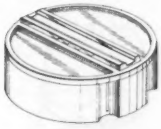
237,945
BOTTLE
Gordon A. Strand, Toledo, Ohio, assignor to Owens-Illinois, Inc.
Filed May 13, 1974, Ser. No. 469,372
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—127

237,946
COMBINED BOTTLE AND CAP THEREFOR
John Pardo, Yonkers, N.Y., assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Apr. 4, 1973, Ser. No. 347,675
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—128

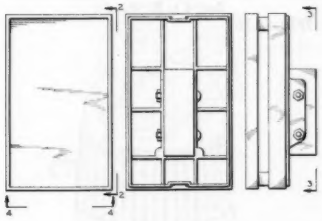
237,947
CONTAINER FOR MATCHES OR THE LIKE
Nobuyoshi Ochiai, 4–18 Kisshiki-cho, Omiya-shi, Saitama-ken, Japan
Filed Dec. 17, 1973, Ser. No. 424,931
Claims priority, application Japan Oct. 15, 1973
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—173



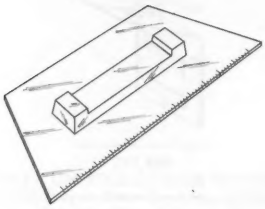
237,948
REPAIRING AND SPLICING KIT CONTAINER
John V. Nowicki, St. Paul, and Harold K. Gavere, Marine-on-St. Croix, Minn., assignors to Minnesota Mining & Manufacturing Co., St. Paul, Minn.
Filed Apr. 8, 1974, Ser. No. 458,641
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—174



237,949
THERMOSTAT
Herbert J. Taylor and Gordon R. Boyd, Aloha, Oreg., assignors to Sunne Controls Division of Peco Manufacturing Co., Inc., Portland, Oreg.
Filed Jan. 2, 1974, Ser. No. 429,595
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—50

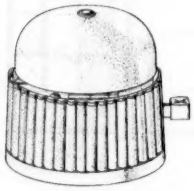


237,950
DRAFTING INSTRUMENT
Peter S. Hoagland, 18769 Saratoga, Lathrup Village, Mich. 48076
Original design application Dec. 15, 1971, Ser. No. 208,511, now Patent No. D. 232,051, which is a continuation in part of Ser. No. 160,234, dated July 6, 1971, Patent No. D. 226,226. Divided and this application Jan. 2, 1974, Ser. No. 429,790
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—62

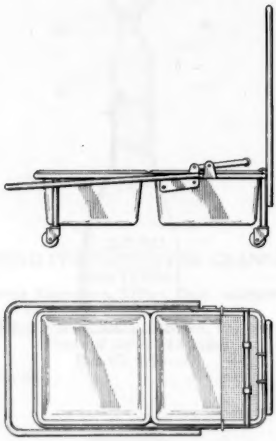


237,951
ANEMOMETER
R. A. Simerl, 528 Epping Forest Road, Annapolis, Md. 21401
Filed May 10, 1974, Ser. No. 468,641
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—96

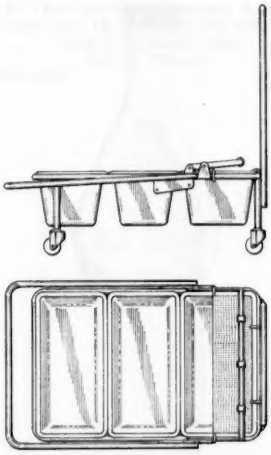
237,952
BELL
Masakatsu Nakada, Tachibana 5-35-2, Sumida-ku, Tokyo, Japan
Filed Oct. 22, 1974, Ser. No. 516,955
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—116



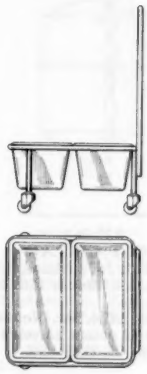
237,953
UTILITY CLEANING CART
George E. Seufert, Lakewood, and Carl B. Davis, Denver, Colo., assignors to Market Achievement Programs, Inc., Denver, Colo.
Filed Mar. 8, 1974, Ser. No. 449,340
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—29



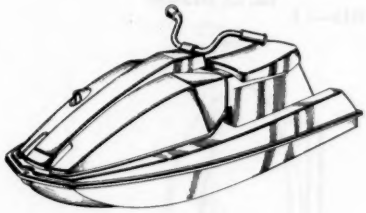
237,954
UTILITY CLEANING CART
George E. Seufert, Lakewood, and Carl B. Davis, Denver, Colo., assignors to Market Achievement Programs, Inc., Denver, Colo.
Filed Mar. 8, 1974, Ser. No. 449,341
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—29



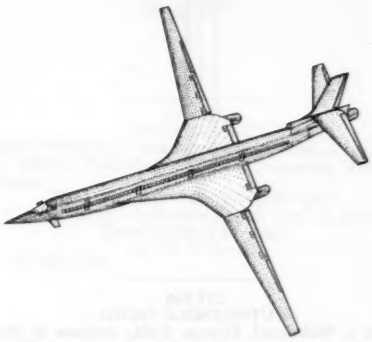
237,955
UTILITY CLEANING CART
George E. Seufert, Lakewood, and Carl B. Davis, Denver, Colo, assignors to Market Achievement Programs, Inc., Denver, Colo.
Filed Mar. 8, 1974, Ser. No. 449,342
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—29



237,956
WATER SCOOTER
Hiroshi Naito, Miki, and Katsuichi Kato, Akashi, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan
Filed Sept. 9, 1974, Ser. No. 504,062
Claims priority, application Japan Apr. 16, 1974
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—69



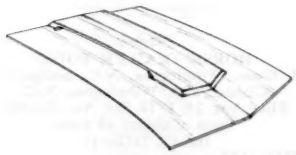
237,957
AIRCRAFT
Lawrence Bernard Rellis, Miami, Fla. (2209 W. Villa Maria Drive, Phoenix, Ariz. 85023)
Filed Apr. 4, 1974, Ser. No. 457,993
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—78



237,958
HORSE TRAILER BODY
Bobby J. Gore, Wilmington, N.C., assignor to Fiber Classics, Ltd., Wilmington, N.C.
Filed Apr. 25, 1974, Ser. No. 463,888
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—105

237,959
BICYCLE STEERING POST
Carlton P. Pawsat, Maysville, Ky., assignor to Wald Manufacturing Company, Inc., Maysville, Ky.
Filed Aug. 13, 1971, Ser. No. 171,792
Term of patent 14 years
The term of this patent subsequent to July 25, 1986, has been disclaimed
Int. Cl. D12—*11*
U.S. Cl. D12—118

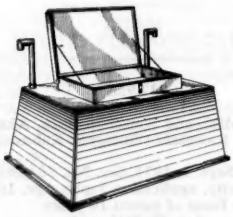
237,960
AUTOMOBILE HOOD
Robert J. Whitehead, Orange, Calif., assignor to Nissan Motor Corporation in U.S.A., Gardena, Calif.
Filed July 24, 1974, Ser. No. 491,311
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—173



237,961
MOTORCYCLE FENDER
Preston L. Petty, 403 N. Main St., Newberg, Oreg. 97132
Continuation-in-part of abandoned design application Ser. No. 316,653, Dec. 20, 1972, and Ser. No. 378,258, July 11, 1973. This application Feb. 28, 1974, Ser. No. 446,650
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—186

237,962
SPINDLE FOR USE IN DOORS, PANELS, OR THE LIKE
Ralph Mondragon, Taos, N. Mex. (P.O. Box 199, Ranchos de Taos, N. Mex. 87557)
Filed Apr. 2, 1974, Ser. No. 457,364
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D13—1 R

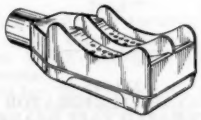
237,963
ROOT CELLAR
Lynn C. Broadbent, Box 267, Alpine, Utah 84033, and William B. Thomas, 8335 South 10th East, Sandy, Utah 84070
Filed Mar. 4, 1974, Ser. No. 447,579
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D13—1 R



237,964
ICE FISHING SHANTY
Roger J. Choponis, 1021 Dyer Lake Road, Traverse City, Mich. 49684
Filed May 18, 1973, Ser. No. 361,474
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D13—1 L

237,965
STEAM TRAP
Ronald D. Schlesch, Three Rivers, Mich., assignor to Armstrong Machine Works, Three Rivers, Mich.
Filed Nov. 27, 1973, Ser. No. 419,437
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—1

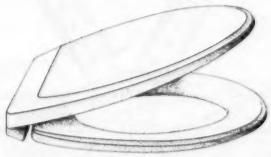
237,966
MASSAGE SPRAY HEAD
Samuel L. McNair, Overland Park, Kans., assignor to Dazey Products Co., Kansas City, Mo.
Filed Dec. 23, 1974, Ser. No. 535,192
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35



237,967
COMBINATION FLUSH VALVE AND BEDPAN RINSER
Henry R. Billeter, Deerfield, Ill., assignor to Sloan Valve Company, Franklin Park, Ill.
Filed Nov. 19, 1973, Ser. No. 417,188
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—38

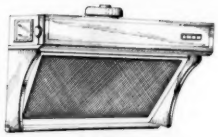
237,968
THUMBSCREW VALVE DEPRESSOR
John W. Olson, Jr., Garland, Tex., assignor to C & D Valve Manufacturing Company, Oklahoma City, Okla.
Filed June 25, 1973, Ser. No. 372,960
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—40

237,969
TOILET SEAT
Jacques Firdmann, Venon par Gieres, France, assignor to Allibert Exploitation Societe Anonyme, Puteaux, France
Filed Oct. 22, 1974, Ser. No. 517,104
Claim priority, application France Apr. 22, 1974
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—71

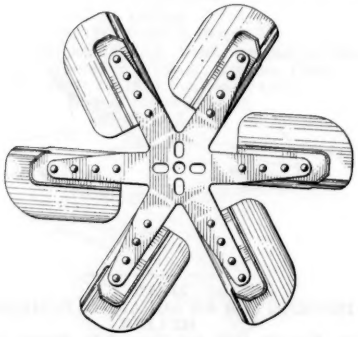


237,970
HOUSING FOR AN AQUARIUM IMMERSION HEATER
Frank Kenneth Hall and Donald D. Moore, Saginaw, Mich., assignors to O'Dell Manufacturing, Inc., Saginaw, Mich.
Filed May 24, 1974, Ser. No. 473,204
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—87

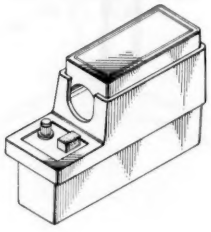
237,971
RANGE HOOD
Yang-K'un Chiang, 82–2 Lane 40 San-Min Road, Taipei, Taiwan, Republic of China
Filed May 28, 1974, Ser. No. 474,065
Claims priority, application Republic of China Apr. 4, 1974
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—151



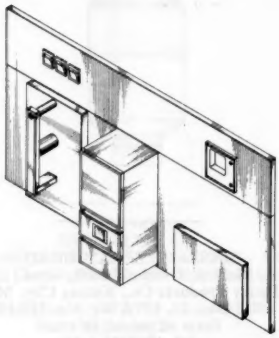
237,972
FAN FOR INTERNAL COMBUSTION ENGINES
Bern M. Bonifant, Tacoma, Wash., assignor to Flex-A-Lite Corporation, Tacoma, Wash.
Filed Feb. 26, 1975, Ser. No. 553,159
Term of patent 14 years
Int. Cl. D15—*01;* D23—*04*
U.S. Cl. D23—165



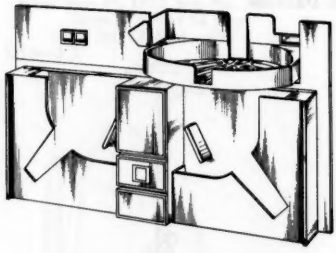
237,973
COMBINATION BATTERY HOLDER AND BATTERY
Ralph Stern, 6719 Shenandoah Ave., Los Angeles, Calif. 90056
Filed Feb. 21, 1974, Ser. No. 444,541
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D26—4



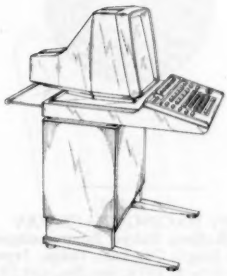
237,974
COMBINATION PERFORATOR AND PERFORATED TAPE READER
Gene D. Vedder, Granada Hills, Calif., assignor to Ex-Cell-O Corp. (Remex)
Filed Sept. 7, 1973, Ser. No. 394,995
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



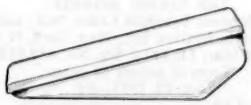
237,975
COMBINATION PERFORATOR AND PERFORATED TAPE READER
Gene D. Vedder, Granada Hills, Calif., assignor to Ex-Cell-O (Remex)
Filed Sept. 7, 1973, Ser. No. 395,197
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

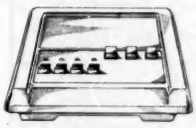


237,976
KEYBOARD AND DISPLAY UNIT
William L. Wolfe, and Robert C. Zimmerman, Manlius, and Gerald M. Adams, Fayetteville, N.Y., assignors to SCM Corporation, New York, N.Y.
Filed July 29, 1974, Ser. No. 492,623
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



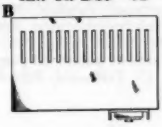
237,977
HOUSING FOR ELECTRONIC CONSOLE
Robert Brian Isaacs, Ottawa, Ontario, Canada, assignor to Northern Electric Company Limited, Montreal, Quebec, Canada
Filed Jan. 28, 1975, Ser. No. 544,853
Term of patent 14 years
Int. Cl. D13—*03;* D14—*02*
U.S. Cl. D26—5 R





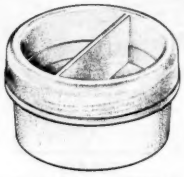
237,978
TAPE RECORDER OR SIMILAR ARTICLE
Peter Hartwein, Schwalbach, Taunus, Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Germany
Filed Feb. 22, 1974, Ser. No. 445,299
Claims priority, application Germany Sept. 2, 1973
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 B

237,979
BATTERY CHARGER
Robert J. Debrey, Edina, Minn., assignor to Magnetic Controls Company, Minneapolis, Minn.
Filed Apr. 15, 1974, Ser. No. 461,154
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D26—15 B



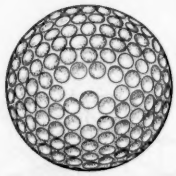
237,980
CATTLE FEEDER
George Doyle Clugston, P.O. Box 581, R.R. 3, Pittsburg, Kans. 66762
Filed Aug. 30, 1973, Ser. No. 392,973
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13

237,981
COMBINED CONTAINER AND TEST CUP INTENDED FOR BACTERIOLOGICAL PREPARATIONS AND FOR BACTERIOLOGICAL TESTS
Carl Edvard Mastrell, Helsingor, Denmark, assignor to AB Leo, Helsingborg, Sweden
Filed Feb. 20, 1974, Ser. No. 444,179
Claims priority, application Sweden Aug. 21, 1973
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D32—1 R

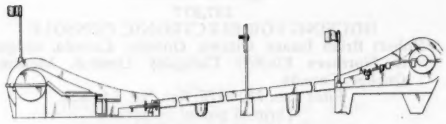


237,982
MINIATURIZED SPECTROPHOTOMETER
Paul A. Hoogesteger, Penfield, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Apr. 25, 1974, Ser. No. 464,006
Term of patent 14 years
Int. Cl. D10—*04;* D24—*02*
U.S. Cl. D32—2 C

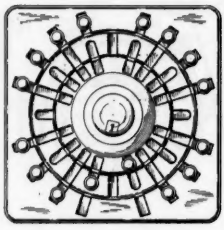
237,983
GOLF BALL
Francis de S. Lynch, Mattapoisett, and John W. Jepson and Robert A. Brown, Marion, Mass., assignors to Acushnet Company, New Bedford, Mass.
Filed Mar. 1, 1973, Ser. No. 337,078
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 QQ



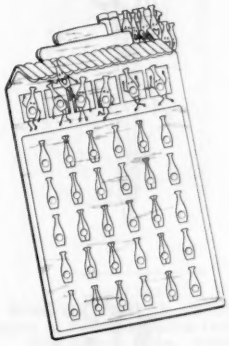
237,984
TOY RACING TRACKWAY
Shizuka Kojima, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Feb. 5, 1974, Ser. No. 439,752
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 CC



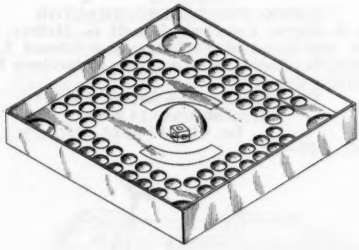
237,985
DIE GAME BOARD
Albert Stubbmann, Franklin Lakes, N.J., assignor to Gabriel Industries, Inc., New York, N.Y.
Filed Mar. 11, 1974, Ser. No. 450,015
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



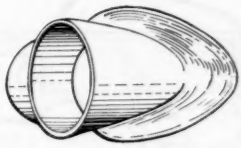
237,986
GAMEBOARD
Albert Stubbmann, Franklin Lakes, N.J., assignor to Kohner, Inc., Elmwood Park, N.J.
Filed Mar. 20, 1974, Ser. No. 452,772
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



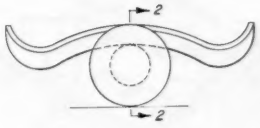
237,987
GAMEBOARD
Albert Stubbmann, Franklin Lakes, N.J., assignor to Kohner, Inc., Elmwood Park, N.J.
Filed Mar. 20, 1974, Ser. No. 452,860
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



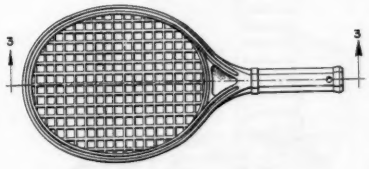
237,988
GRIP LOCATOR FOR A TENNIS RACQUET
Hector O. Conde, Richmond, and Jose G. Vidal, Kensington, Calif., assignors to Electronic Protection Systems
Filed Apr. 8, 197-, Ser. No. 458,556
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 ST



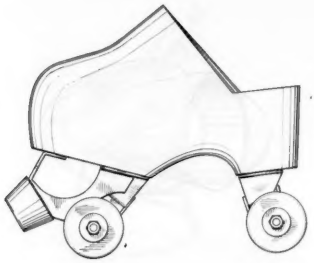
237,989
ROLLER BOARD
Will Clarke England, 7310 Eastcrest, Austin, Tex. 78752
Filed May 24, 1974, Ser. No. 473,936
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 K



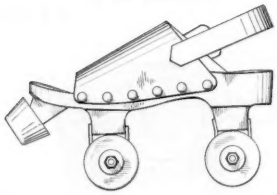
237,990
TENNIS RACQUET
Monte C. Gillespie, and Darle L. Kerkenbush, South Bend, Ind., assignors to South Bend Toy Manufacturing Company, Inc., South Bend, Ind.
Filed Nov. 8, 1974, Ser. No. 522,096
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 ST



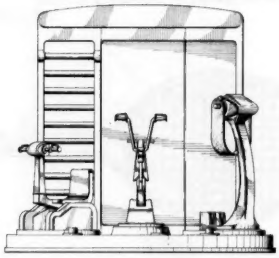
237,991
CLOG ROLLER SKATE
Joseph P. Famolare, Jr., Florence, Italy, assignor to Famolare, Inc., New York, N.Y.
Filed Mar. 1, 1974, Ser. No. 447,313
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—14 C



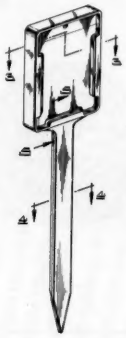
237,992
SANDAL ROLLER SKATE
Joseph P. Famolare, Jr., Florence, Italy, assignor to Famolare, Inc., New York, N.Y.
Filed Mar. 1, 1974, Ser. No. 447,314
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—14 C



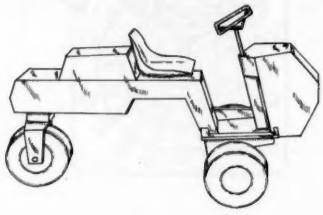
237,993
TOY HEALTH CENTER
Osamu Takahashi, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Aug. 27, 1974, Ser. No. 500,936
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AC



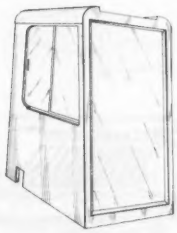
237,994
GARDEN PLANT IDENTIFICATION STAKE
John D. Davis, Fort Worth, Tex., assignor to Loma Corporation
Filed Sept. 13, 1974, Ser. No. 505,534
Term of patent 14 years
Int. Cl. D19—*08*
U.S. Cl. D35—1



237,995
LAWN AND GARDEN TRACTOR
Dean A. Meyer, Caledonia, Donald G. Haffner, Glendale, and Knud H. Hoffmeyer and Edward J. Lazzeroni, Sr., Racine, Wis. assignors to Jacobsen Manufacturing Company
Filed Aug. 23, 1974, Ser. No. 500,161
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D40—5

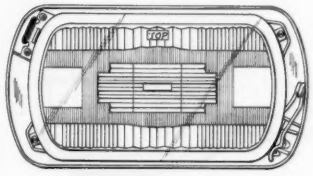


237,996
CAB FOR EARTH MOVING AND HANDLING MACHINERY OR THE LIKE
Bernard Jean Marie Pierre, Crepy-en-Valois, France, assignor to Poclain, Le Plessis-Belleville, Oise, France
Filed Oct. 18, 1974, Ser. No. 516,091
Claims priority, application France Apr. 23, 1974
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D40—5

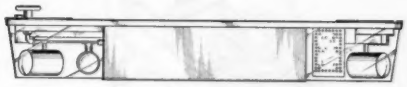


237,997
RING OR SIMILAR ARTICLE
Eugene A. Poulin, 85 Royal Oak Road, New Britain, Conn. 06053
Continuation-in-part of abandoned design application Ser. No. 344,469, filed Mar. 26, 1973. This application June 24, 1974, Ser. No. 482,094
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—10 B

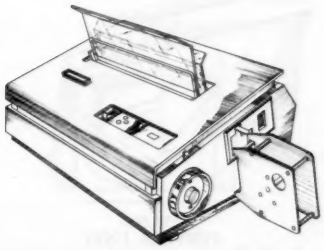
237,998
MOTOR VEHICLE HEADLIGHT
Pierre Cibie, Paris, France, assignor to Cibie Projecteurs, Bobigny, France
Filed Oct. 4, 1974, Ser. No. 511,954
Claims priority, application France Apr. 11, 1974
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32 R

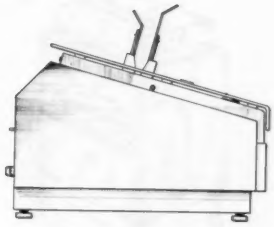


237,999
WARNING DEVICE FOR EMERGENCY VEHICLES OR THE LIKE
Richard C. Runyon, Los Angeles, Calif., assignor to Royal Industries
Filed Jan. 16, 1975, Ser. No. 541,583
Term of patent 14 years
Int. Cl. D10—*06*; D26—*06*
U.S. Cl. D48—32 R

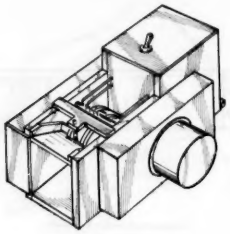


238,000
BOOKBINDING MACHINE
Jacob W. Patla, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Dec. 19, 1973, Ser. No. 426,172
Term of patent 14 years
Int. Cl. D18—*04*
U.S. Cl. D55—1 R

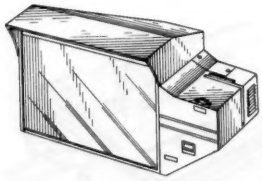




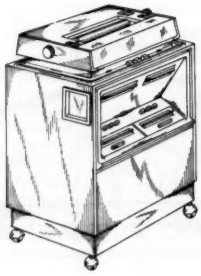
238,001
SORTER FOR ELECTRICAL COMPONENT TESTING APPARATUS
Frederick Wohlman, Jr., 2409 Chelsea Road, Palos Verdes Estates, Calif. 90274
Filed Mar. 27, 1974, Ser. No. 455,207
Term of patent 3½ years
Int. Cl. D15—*99*
U.S. Cl. D55—1 D



238,002
APERTURE CARD READER OR SIMILAR ARTICLE
Roger A. Gross, Hartford, Wis., assignor to Bell & Howell Company, Chicago, Ill.
Filed Mar. 4, 1974, Ser. No. 448,172
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1 N



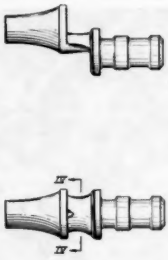
238,003
PRINTER UNIT
William L. Wolfe, Manlius, Robert S. Metzner, Syracuse, and Robert C. Zimmerman, Manlius, N.Y., assignors to SCM Corporation, New York, N.Y.
Filed July 29, 1974, Ser. No. 492,624
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D64—11 R



238,004
SHEET COLLATOR
Arne Egil Holmquist, Hagersten, Sweden, assignor to Lindaco Ltd., Geneva, Switzerland
Filed Aug. 22, 1974, Ser. No. 499,776
Claims priority, application Sweden Feb. 22, 1974
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D64—11 R

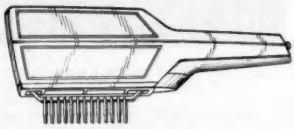
238,005
PAPERWEIGHT OR SIMILAR ARTICLE
Hazel Jacks, 5520 Sabine Drive, Marrero, La. 70072
Filed July 6, 1973, Ser. No. 377,134
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—97

238,006
NOZZLE FOR AN EAR SYRINGE OR THE LIKE
Roy A. Anderson, 4554 Malden Ave., Chicago, Ill. 60640
Filed Mar. 13, 1973, Ser. No. 340,916
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1 Q

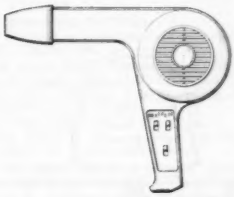


238,007
POST AURICULAR PRESSURE DRESSING
James L. Geraci, Cincinnati, Ohio, assignor to Xomox Corporation, Cincinnati, Ohio
Filed Apr. 29, 1974, Ser. No. 465,205
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1 J

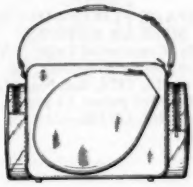
238,008
HAND HELD DETANGLER
Bernard B. Bluestein, Des Plaines, and Norman A. Steinkamp, Chicago Heights, Ill., assignors to Sunbeam Corporation, Chicago, Ill.
Filed July 15, 1974, Ser. No. 488,549
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—8



238,009
HAIR DRYER
Douglas A. Long, 94 Sturges Ridge Road, Wilton, Conn. 06897, and Frederick A. Burke, 40 Riverside Ave., Riverside, Conn. 06878
Filed July 17, 1974, Ser. No. 489,201
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 F

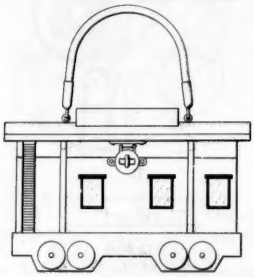


238,010
CARRYING CASE
Joaquin J. Canton, 707 E. 242nd St., Bronx, N.Y. 10470
Filed June 17, 1974, Ser. No. 479,833
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R

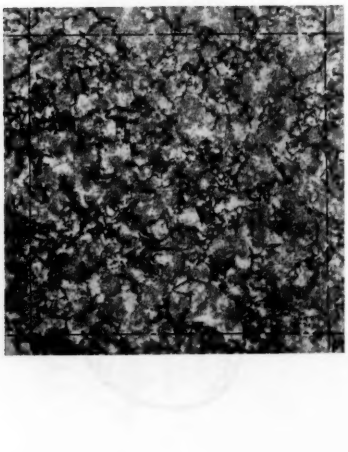


238,011
CARRYING CASE
Joaquin J. Canton, 707 E. 242nd St., Bronx, N.Y. 10470
Filed June 17, 1974, Ser. No. 479,836
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R

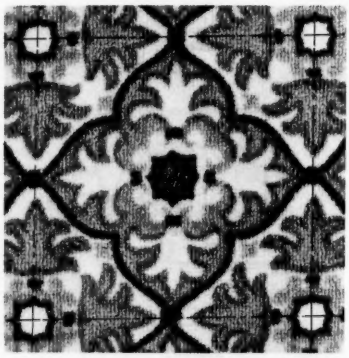
238,012
HANDBAG
Nancy M. Huseman, 3836 Nine Mile Road; Joyce R. Castellini, Woodsedge Road; and Joan M. Feldkamp, 6793 High Meadows, all of Cincinnati, Ohio 45230
Filed Aug. 10, 1973, Ser. No. 387,434
Term of patent 7 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 C



238,013
SOFT SURFACE FLOOR COVERING OR SIMILAR ARTICLE
Robert N. Byerly, Greenwood Lake, N.Y., assignor to Congoleum Industries, Inc.
Filed Feb. 15, 1974, Ser. No. 442,700
Term of patent 14 years
Int. Cl. D6—*11*
U.S. Cl. D92—4 R



238,014
SOFT SURFACE FLOOR COVERING OR SIMILAR ARTICLE
Philip Nugent, North Andover, Mass., assignor to Congoleum Industries, Inc.
Filed Feb. 28, 1974, Ser. No. 446,982
Term of patent 14 years
Int. Cl. D6—*11*
U.S. Cl. D92—4 R



238,015
SOFT SURFACE FLOOR COVERING OR SIMILAR ARTICLE
Philip Nugent, North Andover, Mass., assignor to Congoleum Industries, Inc.
Filed Feb. 28, 1974, Ser. No. 446,983
Term of patent 14 years
Int. Cl. D6—*11*
U.S. Cl. D94—4 R

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 9TH DAY OF DECEMBER, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Nattermann & Cie. GmbH: *See—*
Betzing, Hans; and Lekim, Dac, 3,925,158.

A & P Products Incorporated: *See—*
Venaleck, John T., 3,924,916.

A-T-O, Inc.: *See—*
Hilger, Edwin T.; and Miller, James S., 3,924,300.

AB Ferrosan: *See—*
Borretzen, Bernt; Olsson, Knut Gunnar; and Sundbeck, Bertil, 3,925,487.

Abadie, Erwin I.: *See—*
Roos, Dewey A.; Lawlor, Kenneth A.; and Abadie, Erwin I., 3,924,535.

Abbott Laboratories: *See—*
Hirata, Arthur Atsunobu, 3,925,541.
Horrom, Bruce Wayne, 3,925,475.

Abdel-Monem, Mahmond M.; and Anderson, Dean R., to Zinpro Corporation. 1:1 And 2:1 chromium, alpha amino acid complex salts. 3,925,433, Cl. 260-438.50R.

Abe, Shunji. Process for preparing snack-foods from starch. 3,925,567, Cl. 426-559.000.

Abolins, Visvaldis: *See—*
Cooper, Glen D.; and Abolins, Visvaldis, 3,925,509.

Acorn Engineering Company: *See—*
Morris, Earl L.; and Sally, Theodore J., 3,924,279.

Adams, Herbert H. F.; Anderson, Jon C.; Blair, Murray R., Jr.; DiRubio, Robert L.; and Takman, Bertil H., to Astra Pharmaceutical Products, Inc. Tetiary-alkylamino-lower-acyl-xylidide local anaesthetics. 3,925,469, Cl. 260-562.00B.

Adams, John Benjamin, Jr.; and Schwing, Gregory Wayne, to Du Pont de Nemours, E. I., and Company. Quinoxalinylthioallophanate fungicides. 3,925,380, Cl. 260-250.00Q.

Addison, Benjamin Alfred. Endotracheal tube holder. 3,924,636, Cl. 128-351.000.

Addor, Roger Williams: *See—*
Wagner, Frank Albert, Jr.; and Addor, Roger Williams, 3,925,516.

Adomat, Gunter: *See—*
Hutgens, Jochen; and Adomat, Gunter, 3,925,042.

AEG-Elotherm G.m.b.H.: *See—*
Reinke, Friedhelm; Stengel, Edgar; and Emde, Friedhelm, 3,925,570.

Aerojet-General Corporation: *See—*
Cohen, Joseph; and Zimmerman, Gilbert A., 3,924,405.

Affiliated Manufacturers Inc.: *See—*
Atkinson, Russell W., 3,924,529.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
Jacques, Jean, 3,925,482.

Agency of Industrial Science & Technology: *See—*
Kamei, Masutada, 3,925,137.

Agfa-Gevaert Aktiengesellschaft: *See—*
Meyer, Rudolf; and Ranz, Erwin, 3,924,946.
Wingender, Kaspar; and Vetter, Hans, 3,925,075.

Agouri, Elias; Favie, Claude; and Rebeille, Jean-Claude. Process to reduce blocking in ethylene or propylene polymer of copolymer films without reducing their optical properties. 3,925,508, Cl. 260-876.00R.

Ahlstone, Arthur G., to Vetco Offshore Industries, Inc. Casing hanger and packing running apparatus. 3,924,678, Cl. 166-120.000.

Air Products and Chemicals, Inc.: *See—*
Heiberger, Charles A., 3,925,337.

Aisin Seiki Kabushiki Kaisha: *See—*
Sugisawa, Masakazu, 3,924,705.

Ajinomoto Co., Inc.: *See—*
Enei, Hitoshi; Matsui, Hiroshi; and Hirose, Yoshio, 3,925,154.

Akamatsu, Takashi; Koga, Koichi; Kondo, Mitsuru; Miyake, Makoto; and Iwasaki, Hiroshi, to Sumitomo Chemical Company, Limited; and Kanzaki Paper Manufacturing Co., Ltd. Benz[c]fluoran compounds and recording sheet containing the same. 3,925,416, Cl. 260-335.000.

Akashi, Kageyasu: *See—*
Ishida, Torao; Ohoishi, Junichi; Yoshida, Kouichi; Akashi, Kageyasu; Takeda, Isao, deceased; and Takeda, Emiko, legal representative, 3,925,415.

Akashi, Naotomo: *See—*
Kushihashi, Akira; Fuziwara, Yutaka; and Akashi, Naotomo, 3,925,050.

Akiyama, Taichiro. Method for closing a cut end of a blood vessel. 3,924,629, Cl. 128-325.000.

Aktiebolaget Astra: *See—*
Dahlbom, Johan Richard; Karlen, Bo Lennart; and Lindgren, Sune Gunnar, 3,925,411.

Aktieselskabet Jens Villadsens Fabriker: *See—*
Pedersen, Kristen Hald, 3,924,368.

Albers, Edwin Wolf: *See—*
Scherzer, Julius; and Albers, Edwin Wolf, 3,925,195.

Albert, Richard D. Selectable wavelength X-ray source, spectrometer and assay method. 3,925,660, Cl. 250-272.000.

Albinger, Harry, Jr., to General Electric Company. Variable time switch with variable control cam structure for different time periods and modes of operation. 3,925,629, Cl. 200-38.00R.

Albright & Wilson Limited: *See—*
Coates, Harold; Collins, John Desmond; and Siddiqui, Iftikhar Hussain, 3,925,246.
Ely, Christopher Scott, 3,925,331.

Aldo, Bruce D. Method and apparatus for automatically splicing film. 3,925,143, Cl. 156-505.000.

Alexander, Carl J., to Wells Manufacturing Corporation. Portable power-driven harvesting implement. 3,924,390, Cl. 56-328.0TS.

Alexander, John Bert, to Illinois Tool Works Inc. Self-piercing blind fastener. 3,924,509, Cl. 85-68.000.

Algoma Steel Corporation, Limited, The: *See—*
Franceschina, Louis E.; Haromy, Fred; and Kruppert, Frederick W., 3,924,435.

Allan, Colin J.; and Bayly, John G., to Canada, Atomic Energy of, Limited. Gas detection system. 3,925,666, Cl. 250-338.000.

Allard, Frederick C., to United States of America, Navy. Helix pitch monitor. 3,924,953, Cl. 356-167.000.

Allegheny Ludlum Industries, Inc.: *See—*
Salsgiver, James A.; and Malagari, Frank A., 3,925,115.

Allen, George H.; and Rhee, Jhoon Goo. Protective device for use by football athletes. 3,924,272, Cl. 2-16.000.

Allen, Travis A.; and Sylvester, Robert T., to United States of America, Energy Research and Development Administration. Solder leveling process. 3,924,794, Cl. 228-256.000.

Allied Chemical Corporation: *See—*
Barton, Oliver A., 3,925,010.
Marshall, Robert Moore; and Dardoufas, Kimon Constantine, 3,925,588.

Allmanna Svenska Elektriska Aktiebolaget: *See—*
Carlsson, Lars Erik; Grevillius, Nils Fredrik; and Hellner, Lars Ivar, 3,925,061.

Alouges, Aime Elie, to Centre National d'Etudes Spatiales. Device for taking sequences of aerial photographs. 3,925,794, Cl. 354-70.000.

Alpha Bebe Sante, Zone Industrielle: *See—*
Seunevel, Thierry B., 3,924,620.

Alpha Industries, Inc.: *See—*
Borzym, John J., 3,924,502.

Alps Electric Co., Ltd.: *See—*
Hamada, Kenji, 3,925,682.

Alps Motorola, Inc.: *See—*
Tahara, Kumeo, 3,925,818.

Alsup, James M.: *See—*
Speiser, Jeffrey M.; Whitehouse, Harper J.; and Alsup, James M., 3,925,648.

Altair, Inc.: *See—*
Mancusi, Joseph J., Jr., 3,924,631.

Althausen, Ferdinand; Boden, Heinrich; Ersfeld, Heinz; Klier, Lothar; Raffel, Reiner; and Schneider, Walter, to Bayer Aktiengesellschaft; and Maschinenfabrik Hennecke GmbH. Machine for producing moldings from chemical components which react quickly with one another. 3,924,989, Cl. 425-130.000.

Althuber, Horst; and Rupp, Karl, to U.S. Philips Corporation. Optical drive control with head mounted light guide means. 3,925,817, Cl. 360-74.000.

Altman, Carl; Chapman, Sydney G.; and Satya, Akella V. S., to International Business Machines Corporation. Method to improve the reverse leakage characteristics in metal semiconductor contacts. 3,924,320, Cl. 29-578.000.

Aluminum Company of America: *See—*
Cady, Edward W.; and Parsons, George R., 3,924,315.
Hawkins, Ronald G., 3,925,595.
Rawlins, Charles B., 3,925,594.

Amerace Corporation: *See—*
Faroni, Charles C., 3,924,507.

American Chemical & Refining Company, Inc.: *See—*
Skomoroski, Robert M.; and Zobbi, Robert G., 3,925,170.

American Cyanamid Company: *See—*
Cross, Barrington, 3,925,408.
Spector, Richard; and Stretanski, Joseph Anthony, 3,925,518.
Voorhies, John Davidson, 3,925,172.
Wagner, Frank Albert, Jr.; and Addor, Roger Williams, 3,925,516.
Zipperian, Donald Edwin; Jones, James Allen; and Buza, Thomas Brian, 3,925,218.

American Farm Systems, Inc.: *See—*
Stewart, Richard P., 3,924,367.

American Home Products Corporation: *See—*
Corey, Garland G.; and Weinstein, Bernard, 3,925,227.
Kim, Dong H., 3,925,361.
Wei, Peter H. L.; and McCaully, Ronald J., 3,925,370.

American Optical Corporation: *See—*
Coates, Vincent J.; and Welter, Leonard M., 3,925,664.

American Polywater Corporation: *See—*
Moorhouse, Thomas R., 3,925,216.

American Power Tread Corporation: *See—*
Everhardt, William F.; Brown, Henry L., Jr.; and Dennis, Clement O., Sr., 3,925,005.

Ames, Robert G., to Ames, Ulysses Stanley, a part interest. Corner roller for embedding tape in mastic. 3,925,145, Cl. 156-579.000.

Ames, Robert K., to Resources Conservation Co. Method of dewatering material containing solid matter and bound and unbound water. 3,925,201, Cl. 210-22.000.

Ames, Ulysses Stanley: *See—*
Ames, Robert G., 3,925,145.

AMF Incorporated: *See—*
Cummins, Donald, 3,924,549.
Cummins, Donald, 3,924,554.
Diacont, George P., Jr.; and Serio, Vincent J., Jr., 3,924,785.
Durdin, Peter Robert, 3,924,416.
Eisenlohr, Gerald Mason, 3,924,900.
Neville, Richard Ernest Gartside; and Garrett, John A., 3,924,645.
Sorensen, Egon, 3,924,778.

Amlung, Clifford L., to Security Devices Corporation. Field disturbance type motion detection system. 3,925,774, Cl. 340-258.00A.

Amoroso, Salvatore, to United Technologies Corporation. Skirt-tuned single oscillator transceiver. 3,925,729, Cl. 325-17.000.

AMP Incorporated: *See—*
Shoemaker, John Robert, 3,924,923.

Amsted Industries Incorporated: *See—*
Kent, John Allen; Love, Robert B.; and Meyer, Harold Louis, 3,924,909.
Sandor, Louis; Germain, Andrew Gerald; Wiles, Donald Ray; and Filippini, Ronald A., 3,924,422.

Anaconda American Brass Company: *See—*
Costas, Louis P., 3,925,168.

Anderl, Josef H.; and Oliva, George R., Jr., to United States of America, Army. Adaptive RF power output control for net radios. 3,925,782, Cl. 343-178.000.

Anders, Robert; and Kussow, Daniel H., to General Motors Corporation. Railway car dual access level selection apparatus. 3,924,545, Cl. 105-450.000.

Andersen, Harry M., to Monsanto Company. Ethylene/vinyl chloride interpolymers. 3,925,287, Cl. 260-29.6TA.

Anderson, Dean R.: *See—*
Abdel-Monem, Mahmond M.; and Anderson, Dean R., 3,925,433.

Anderson, Donald E., to G. T. Schjeldahl Company. Solar energy conversion system. 3,924,604, Cl. 126-270.000.

Anderson, Jon C.: *See—*
Adams, Herbert H. F.; Anderson, Jon C.; Blair, Murray R., Jr.; DiRubio, Robert L.; and Takman, Bertil H., 3,925,469.

Anderson, Norman C.; and Rupert, Robert E., to F-S Inc. Spectral sensor and method. 3,925,668, Cl. 250-351.000.

Anderson, Perry W.: *See—*
Glabe, Elmer F.; Anderson, Perry W.; and Laftsidis, Stergios, 3,925,559.

Anderson, Robert Craig; and Gibson, James Andrew, to Imperial Chemical Industries Limited. Smoking mixtures. 3,924,644, Cl. 131-17.00R.

Anderson, Thomas W.: *See—*
Heitlinger, Louis J.; Bahr, John P.; Smith, John H.; and Anderson, Thomas W., 3,925,762.

Andreaggi, Joseph R.; and Zenuch, George, to Weston Instruments, Inc. Positively lockable angularly adjustable handle. 3,924,775, Cl. 220-96.000.

Andrejasich, Frank H.: *See—*
Greenwood, Arthur R.; Heinze, Walter W.; Schnitta, Edward; and Andrejasich, Frank H., 3,925,025.

Andres, Rudolf; Moller, Hermann; and Seyfried, Franz, to Daimler-Benz Aktiengesellschaft. Pneumatic control system for self alignment of motor vehicle headlights. 3,925,656, Cl. 240-7.1LJ.

Andrich, John. Fluid coupling. 3,924,831, Cl. 251-149.700.

Andrus, Edward R., Jr.; Fahnstrom, Dale E.; Hansen, James G.; and Nichols, Charles E., to Elder Wilbert Corporation. Burial casket. 3,924,309, Cl. 27-2.000.

Anghinetti, Joseph R.; Couture, Paul A.; and Jentoft, Arthur P., to Wasco Products, Inc. Drop-out fire vent. 3,924,372, Cl. 52-232.000.

Angner, Ronald Joseph; and Feiner, Alexander, to Bell Telephone Laboratories, Incorporated. Transient controlled telephone line circuit. 3,925,625, Cl. 179-99.000.

Anna, Leo A.; and Dixon, Kenneth C., to Research Abrasive Products, Inc. Resin bonded grinding wheel containing gas-filled thermoplastic resin beads and method of making it. 3,925,034, Cl. 51-296.000.

Ansafone Limited: *See—*
Robinson, Stephen Perrin, 3,925,622.

Aoki, Hachiro, to Diesel Kiki Co., Ltd. Diesel engine fuel injection pump governor. 3,924,594, Cl. 123-140.0CC.

Aoki, Katashi. Injection device for synthetic resin injection molding. 3,924,994, Cl. 425-242.00R.

Aoyagi, Katumi, to Kojima, Shiro. Sticker. 3,925,585, Cl. 428-42.000.

Apostol, Frank: *See—*
Evers, Albert Leo, 3,924,346.

Apostolov, Roumen Konstantinov: *See—*
Popov, Encho Nikolov; Diakov, Nikola Ganev; Dobreva-Dimitrova, Emilia; Apostolov, Roumen Konstantinov; and Hristov, Hristo Petkov, 3,925,696.

Araki, Michiya: *See—*
Matsuo, Kazuto; Araki, Michiya; Matsugu, Tomoyuki; and Mikami, Takahito, 3,925,290.

Archer Daniels Midland Company: *See—*
Daftary, Rasik D., 3,925,569.

Archivar Industrie Chimiche del Trentino S.p.A.: *See—*
Marsili, Leonardo; and Pasqualucci, Carmine, 3,925,366.

Arendt, Hans F. Presses for washing. 3,924,425, Cl. 68-242.000.

Arizona Chemical Company: *See—*
Scharrer, Roland Pierre Franz, 3,925,342.

Armco Steel Corporation: *See—*
Flinchum, Charles; Dunbar, F. Curtiss; and Arnold, Jerry L., 3,925,579.

Arndt, Friedrich: *See—*
Nusslein, Ludwig; and Arndt, Friedrich, 3,925,473.

Arnold, Fred E.; Breland, John G.; and Villaescusa, Frank W., to United States of America, Air Force. Thermally stable aryloxybenzimidazobenzophenanthroline compositions. 3,925,311, Cl. 260-47.0CP.

Arnold, James F., to HydroTech International, Inc. Wellhead lubricator and method. 3,924,686, Cl. 166-315.000.

Arnold, Jerry L.: *See—*
Flinchum, Charles; Dunbar, F. Curtiss; and Arnold, Jerry L., 3,925,579.

Arrandale, Roy S.; and Campagna, Edward R., to Dart Industries Inc. Plastic coated containers having embedded friction reducing particles. 3,924,767, Cl. 215-12.00R.

Artamonov, Viktor Leonidovich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Chekotilo, Leonty Vasilievich; Martyn, Viktor Mikhailovich; Artamonov, Viktor Leonidovich; Bochorishvili, Anzor Ippolitovich; Stupak, Leonid Mikhailovich; Sysenko, Anatoly Petrovich; and Popov, Valery Georgievich, 3,924,672.

Arthur A. Collins, Inc.: *See—*
Collins, Arthur A.; and Pedersen, Robert D., 3,925,621.

Arthur D. Little, Inc.: *See—*
McCullough, John E., 3,924,977.

Asahi-Dow Limited: *See—*
Naito, Hirokuni; Yoshimura, Isao; and Nakano, Hiroo, 3,925,332.

Asahi Glass Co., Ltd: *See—*
Oda, Yoshio; Uchida, Keiichi; Suhara, Manabu; and Morimoto, Takeshi, 3,925,464.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Ibata, Jyoji; Kobayashi, Hidehiko; Toyomoto, Kazuo; Suzuoki, Kazuhiro; and Nogami, Sumitaka, 3,925,272.
Ishida, Torao; Ohoishi, Junichi; Yoshida, Kouichi; Akashi, Kageyasu; Takeda, Isao, deceased; and Takeda, Emiko, legal representative, 3,925,415.
Shimojima, Yukiji; Takeda, Isao, deceased; Takeda, Emiko, legal representative; Mizuno, Masayuki; Mizuno, Yukiko; and Ohoka, Tadaaki, 3,925,546.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Takahashi, Yasuo; and Ogawa, Ryota, 3,924,935.

Asano, Yasuhisa: *See—*
Tottori, Nobumasa; Kato, Toshiro; Asano, Yasuhisa; Ueda, Minoru; Kirino, Osamu; Ooba, Shigehiro; Fujinami, Akira; and Ozaki, Toshiaki, 3,925,554.

Ashworth, William J. Transducer mounting to sounding board. 3,925,627, Cl. 179-181.00W.

Assersen, Soeren Kristian. Remote-controlled valve, preferably for pneumatic sand blast units. 3,924,657, Cl. 137-596.150.

Astra Pharmaceutical Products, Inc.: *See—*
Adams, Herbert H. F.; Anderson, Jon C.; Blair, Murray R., Jr.; DiRubio, Robert L.; and Takman, Bertil H., 3,925,469.

Atkinson, Russell W., to Affiliated Manufacturers Inc. Torsion bar floating squeegee mount for screen printer. 3,924,529, Cl. 101-123.000.

Atlantic Research Corporation: *See—*
Olcott, Eugene L., 3,925,133.

Atlantic Richfield Company: *See—*
Shalit, Harold; and Kieras, Joseph A., 3,925,496.

Atlas Copco Aktiebolag: *See—*
Brannstrom, Kurt Osten; and Karlfors, Levi Johannes, 3,924,691.
Horlin, Dick Axel; and Gunnarsson Ek, Klas Goran, 3,924,696.

Atomic Energy of Canada Limited: *See—*
Bigham, Clifford B.; and Schneider, Harvey R., 3,925,676.

Auman, John T.; Rogers, Wesley A.; and Jones, Trevor O., to General Motors Corporation. Speed compensated fuel consumption warning device. 3,925,753, Cl. 340-52.00R.

Austin, James Raymond; Brown, Martin John; and Loan, Leonard Donald, to Bell Telephone Laboratories, Incorporated; and Western Electric Company, Inc. Irradiating strand material. 3,925,671, Cl. 250-400.000.

Austin, Thomas Howard: *See—*
Yeakey, Ernest Leon; and Austin, Thomas Howard, 3,925,389.

Austral-Erwin Engineering Co.: *See—*
Erwin, Ransome W., 3,925,148.
Erwin, Ransome W., 3,925,149.

Automation Industries, Inc.: *See—*
McElroy, Jerry T.; and Soloway, Sidney, 3,924,454.

Automobiles Peugeot: *See—*
Lefeuvre, Andre, 3,924,875.

Avery, Carl Frederick, to Marion Health and Safety, Inc. Tip for applicator swab. 3,924,623, Cl. 128-269.000.

Avery, Hazelton H.; and Morabito, Salvatore, to Duo-Fast Corporation. Electric fastener driving tool. 3,924,789, Cl. 227-131.000.

Axen, Udo F., to Upjohn Company, The. PGA_3 analogs. 3,925,450, Cl. 260-468.00D.

Axen, Udo F., to Upjohn Company, The. PGF_3 Analogs. 3,925,459, Cl. 260-468.00D.

Axon, Gordon L.; and Montezinos, Beverly K., to Catawba Chemicals, Inc. Eutectic biphenyl-napthalene dye carriers. 3,925,013, Cl. 8-173.000.

Axotronics Inc.: *See*—
Weiss, Gerhard T., 3,924,641.

Ayers, Orval E.: *See*—
Van Landuyt, Dennis C.; and Ayers, Orval E., 3,925,410.

Azuma Engineering Co., Ltd.: *See*—
Azuma, Shiro, 3,924,494.

Azuma, Kishiro; Tsuji, Isao; Kato, Hiroyuki; Tatemichi, Hidemaro; Motegi, Akira; Suzuki, Osamu; and Kondo, Kishichiro, to Toagosei Chemical Industry Co., Ltd. Anaerobic curable compositions. 3,925,322, Cl. 260-78.40E.

Azuma, Shiro, to Azuma Engineering Co., Ltd. Automatic bar feeding apparatus. 3,924,494, Cl. 82-2.700.

B. F. Goodrich Company, The: *See*—
England, John S., 3,924,519.
Jorgensen, August H., 3,925,281.
Knechtges, Donald P.; and Mikoflavy, Bela K., 3,925,293.
Kuts, Mathew, 3,924,503.
McCarthy, William J., 3,925,330.
Valvassori, Alberto; Sartori, Guido; and Cameli, Nazzareno, 3,925,333.

B. V. Koninklijke Machinefabriek: *See*—
Wiemer, Willem; and Besier, Mattheus, 3,925,038.

B. V. Peximac: *See*—
Du Chambon, Michel G. J., 3,924,548.

Babcock, Donald. In-line control valve. 3,924,832, Cl. 251-301.000.

Bachmann, Mario E., to Motorola, Inc. Tape head rotator mechanism for track changing. 3,925,819, Cl. 360-106.000.

Bachtel, Hubert C., Jr., to Barry Wright Corporation. Toggle clamp lock. 3,924,844, Cl. 269-94.000.

Bader, Andre A.; and Weiss, Francis J., to Produits Chimiques Ugine Kuhlmann. Process for preparing dichlorohexadienes. 3,925,493, Cl. 260-654.00R.

Badische Anilin- & Soda-Fabrik Aktiengellschaft: *See*—
Moessner, Manfred; and Kreutze, Gerhard, 3,924,822.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See*—
Fischer, Adolf; Hamprecht, Gerhard; Mangold, Dietrich; and Rohr, Wolfgang, 3,925,439.

Baetz, Jacques, to Seperic. β-Pyridyl-carbonamido-alkane-sulfonic acid salts. 3,925,396, Cl. 260-294.80F.

Bahr, John P.: *See*—
Heitlinger, Louis J.; Bahr, John P.; Smith, John H.; and Anderson, Thomas W., 3,925,762.

Baimbridge, Charles L.; Minderhout, James R.; Bearman, Robert W.; and Carpenter, Donald E., to Nalco Chemical Company. Active Grignard electrode and process. 3,925,169, Cl. 204-1.00T.

Baker, John W. Saw for precision cutting tool. 3,924,318, Cl. 29-567.000.

Baker, Melvin C., to Du Pont de Nemours, E. I., and Company. Process for making polytetramethylene ether glycol having a narrow molecular weight distribution. 3,925,484, Cl. 260-615.00B.

Balamuth, Lewis; Kuris, Arthur; and Karatjas, Manuel, to Ultrasonic Systems, Inc. Ultrasonic dental and other instrument means and methods. 3,924,335, Cl. 32-58.000.

Baldassarri, Agostino; and Cellone, Luigi, to Minnesota Mining and Manufacturing Company. Azotriazole and azotetrazole antifog, antistain and selective desensitizers for silver halide emulsions. 3,925,086, Cl. 96-109.000.

Balinth, Ivan J., to Johnson & Johnson. Pressure sensitive adhesive composition. 3,925,271, Cl. 260-3.000.

Ballenger, William G., to Central Specialties Inc. Bike rack hoist. 3,924,751, Cl. 211-17.000.

Bandy, Robert G. Motor construction. 3,924,959, Cl. 415-1.000.

Banjavich, Mark P.; and Gaudiano, Anthony V., to Taylor Diving & Salvage Co., Inc. Closed circuit, free-flow, underwater breathing system. 3,924,616, Cl. 128-142.300.

Banjavich, Mark P.; and Gaudiano, Anthony V., to Taylor Diving & Salvage Co., Inc. Closed circuit, free-flow, underwater breathing system. 3,924,618, Cl. 128-142.300.

Banjavich, Mark P.; and Gaudiano, Anthony V., to Taylor Diving & Salvage Co., Inc. Closed circuit, free-flow, underwater breathing system. 3,924,619, Cl. 128-142.300.

Banks, Peter Baldwin; and Scholz, Hans, to English Electric Valve Company Limited. Pick-up tubes. 3,925,699, Cl. 313-384.000.

Bannai, Nubuo: *See*—
Ishii, Hajime; Bannai, Nubuo; and Nishita, Sadao, 3,925,339.

Banner, Philip M. Electrical safety grounding device means. 3,924,914, Cl. 339-14.00P.

Bar-on, Ari, to Xerox Corporation. Fusing apparatus having an articulated release material dispenser. 3,924,564, Cl. 118-60.000.

Bardotti, Angelo; and Pederzini, Renzo, to Honeywell Information Systems Italia. Dynamically variable priority access system. 3,925,766, Cl. 340-172.500.

Barenyi, Bela; and Renner, Hermann, to Daimler-Benz Aktiengesellschaft. Protection device for vehicle passengers. 3,924,874, Cl. 280-150.00B.

Barenyi, Bela: *See*—
Renner, Hermann; and Barenyi, Bela, 3,924,707.

Barnett, Barry Roger Michael; and Burton, Arthur William, to TRW Inc. Self-retaining washer. 3,924,955, Cl. 403-230.000.

Barrett, Fred O.: *See*—
Sturwold, Robert J.; and Barrett, Fred O., 3,925,589.

Barry Wright Corporation: *See*—
Bachtel, Hubert C., Jr., 3,924,844.

Barth, Harald H. Flexible jaw clutch coupling. 3,924,419, Cl. 64-14.000.

Bartlow, David H.; Jones, Bernard Howard; and Pearson, Lee E., to Owens-Corning Fiberglas Corporation. Method of forming circumferentially extending ribs on a rotating shell. 3,925,132, Cl. 156-161.000.

Barton, Dale S.; and Yendrich, Stephen P., Jr., to NRM Corporation. Green tire loader. 3,924,983, Cl. 425-38.000.

Barton, Oliver A., to Allied Chemical Corporation. Dry cleaning process utilizing azeatropic nonflammable vapors. 3,925,010, Cl. 8-142.000.

BASF Aktiengesellschaft: *See*—
Elser, Wolfgang; Eilingsfeld, Heinz; and Schoch, Werner, 3,925,427.
Heinrich, Bernhard; Naarmann, Herbert; and Thoma, Peter, 3,925,329.
Mueller-Tamm, Heinz; Schick, Hannes; Rau, Wolfgang; and Hennenberger, Peter, 3,925,341.
Schlichting, Karl; Horn, Peter; Schlag, Johannes; and Koernig, Wolfgang, 3,925,306.

BASF Wyandotte Corporation: *See*—
Schmolka, Irving R., 3,925,241.

Basiulis, Algerd, to Hughes Aircraft Company. Heat valve device. 3,924,674, Cl. 165-32.000.

Bata Shoe Company, Inc.: *See*—
Suler, Ladislav, 3,924,986.

Bateman, Charles Donald; and Muller, Hans Rudolf, to Sundstrand Data Control, Inc. Glide slope warning system with a variable warning rate. 3,925,751, Cl. 340-27.0AT.

Bates, Calvin D.; and Hartley, Joseph H., to United States of America, Army. Rail or pedestal mounted meander line circuit for crossed-field amplifiers. 3,925,738, Cl. 333-31.00R.

Battelle Memorial Institute: *See*—
Richardson, Richard L.; Hildebrand, Bernard P.; and Mahan, Robert E., 3,925,646.

Baugh, Benton F. Underwater connection apparatus. 3,924,446, Cl. 73-37.000.

Baughman, Herbert W.; and Yetter, Harry G. Chisel plow. 3,924,694, Cl. 172-413.000.

Baum, Robert A.: *See*—
Roantree, James P.; Saunders, John; and Baum, Robert A., 3,925,643.

Bauman, Robert Andrew, to Colgate-Palmolive Company. Anti microbial compositions containing unsymmetrical oligoquaternary ammonium compounds. 3,925,556, Cl. 424-329.000.

Bausch & Lomb Incorporated: *See*—
Clark, James A., 3,924,936.

Bayer Aktiengesellschaft: *See*—
Althausen, Ferdinand; Boden, Heinrich; Ersfeld, Heinz; Klier, Lothar; Raffel, Reiner; and Schneider, Walter, 3,924,989.
Bernert, Claus-Rudiger; and Radlmann, Eduard, 3,925,321.
Bockmann, August; Teichmann, Gunter; and Rudolph, Hans, 3,925,095.
Boehmke, Gunther, 3,925,011.
Boehmke, Gunther; and Theidel, Hans, 3,925,367.
Boehmke, Gunther; and Theidel, Hans, 3,925,405.
Buchel, Karl Heinz; Frohberger, Paul-Ernst; Scheinpflug, Hans; and Enders, Edgar, 3,925,551.
Corte, Herbert; Heller, Harold; and Netz, Otto, 3,925,264.
Dorlars, Alfons; and Schellhammer, Carl-Wolfgang, 3,925,390.
Grohe, Klaus; and Frohberger, Paul-Ernst, 3,925,400.
Jager, Gerhard; Wenzelburger, Hans Jurgen; and Schmidt, Robert R., 3,925,386.
Kleimann, Helmut; von Bonin, Wulf; Schneider, Heinz-Georg; and Gebauer, Herbert, 3,925,527.
Kuhle, Engelbert; Grewe, Ferdinand; and Kaspers, Helmut, 3,925,443.
Kuhlthau, Hans-Peter, 3,925,015.
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,925,395.
Muller, Karl-Heinz; Rohr, Harry; and Ott, Karl-Heinz, 3,925,528.
Ringel, Paul; Hildebrand, Dietrich; and Breidbach, Gunter, 3,925,012.
Schafer, Karl; Schuster, Hans; and Klebert, Wolfgang, 3,925,581.
Schuster, Herbert; Huther, Edmund; Ott, Karl-Heinz; and Dinges, Karl, 3,925,513.
Swodenk, Wolfgang; and Scharfe, Gerhard, 3,925,452.
Velker, Eugen; Bentz, Francis; and Nischk, Gunther, 3,925,515.
Vogel, Axel, 3,925,426.
Wolf, Gerhard Dieter; Kunzel, Hans Egon; Blankenstein, Gunther; Kleinschmidt, Peter; and Bentz, Francis, 3,925,310.
Wolfrum, Gerhard; Sommer, Richard; and Klauke, Erich, 3,925,350.
Wollweber, Hartmund; and Flucke, Winfried, 3,925,470.
Wollweber, Hartmund; and Flucke, Winfried, 3,925,471.

Bayly, John G.: *See*—
Allan, Colin J.; and Bayly, John G., 3,925,666.

BBC Brown Boveri & Company Limited: *See*—
Brandli, Gerold; and Keller, Pierre, 3,924,469.

Beach, David E., to Eastman Kodak Company. Battery test apparatus for use in a photographic camera. 3,925,792, Cl. 354-60.000.

Beacham, Ronald; Covington, Dennis; and McNutt, Reginald, to Business Electronics, Inc. Audible signaling device for a computer. 3,925,770, Cl. 340-228.00S.

Bear, Jacob: *See—*
Prenner, Amnon; Bear, Jacob; Tohar, David; and Koplin, Harry, 3,924,677.

Bearman, Robert W.: *See—*
Baimbridge, Charles L.; Minderhout, James R.; Bearman, Robert W.; and Carpenter, Donald E., 3,925,169.

Beaucamp, Klaus; Mollering, Hans; Lang, Gunter; Gruber, Wolfgang; and Roeschlau, Peter, to Boehringer Mannheim G.m.b.H. Method for the determination of cholesterol. 3,925,164, Cl. 195-103.50R.

Beck, Armin. Seat, particularly for motor vehicles. 3,924,613, Cl. 128-24.00R.

Becker, Charles Henry, to TRW Inc. Method of coupling the components of a molding retainer. 3,924,317, Cl. 29-509.000.

Becker, Jean-Jacques: *See—*
Heiler, Wolfgang; Muller, Rudolf; and Becker, Jean-Jacques, 3,924,551.

Becker, Otto Alfred. Resistance welding. 3,925,637, Cl. 219-105.000.

Beecham Group Limited: *See—*
Buckle, Derek Richard; and Smith, Harry, 3,925,557.

Beffa, Fabio: *See—*
Wohlkonig, Alexander; Hindermann, Peter; Beffa, Fabio; and Hegar, Gert, 3,925,348.

Beier, Helmut: *See—*
Kessler, Claus; and Beier, Helmut, 3,925,631.

Beigel, Franz: *See—*
Grau, Dietrich; Beigel, Franz; and Blanz, Roland, 3,924,544.

Beiswenger, David W.; Paddock, Gordon R.; and Ranft, Ernst L., to General Motors Corporation. Diverter valve and pressure regulator assembly. 3,924,408, Cl. 60-290.000.

Bell & Howell Company: *See—*
Gaynor, Joseph, 3,924,530.
Gaynor, Joseph, 3,924,533.

Bell, Richard L.; Walter, Richard T.; Botterman, David L.; and Lewis, Philip W., to Container Corporation of America. Tamperproof display package. 3,924,736, Cl. 206-45.140.

Bell Telephone Laboratories, Incorporated: *See—*
Angner, Ronald Joseph; and Feiner, Alexander, 3,925,625.
Austin, James Raymond; Brown, Martin John; and Loan, Leonard Donald, 3,925,671.
Brainard, Ralph Carter; and Candy, James Charles, 3,925,731.
Cardwell, Robert Edward; Davis, Robert Leon; Marino, Patrick John; and McNamara, Edward Joseph, 3,925,600.
Cardwell, Robert Edward; Carlson, David Emory; Davis, Robert Leon; McNamara, Edward Joseph; Pilc, Randolph John; Schlanger, Gabriel Gary; Tutelman, David Morris; Warwick, Peter Stephen; and Zydney, Herbert Mortimer, 3,925,601.
Cauceglia, Walter Bartholomew; Gerlt, Charles; and Peralta, Luis Arturo, 3,924,370.
Dennis, Thomas Mann, 3,925,611.
Duguay, Michel Albert, 3,925,727.
Earle, Harold Westly; and Robbins, Joseph, 3,925,624.
Firtion, Victor Andrew; Rongved, Leif; and Saunders, Thomas Edward, 3,925,785.
Fraser, David Bruce, 3,925,677.
French, Joseph Charles; Nigam, Anant Kumar; and Sessler, Gerhard Martin, 3,925,610.
Ninke, William Herbert, 3,925,609.
Sondhi, Man Mohan, 3,925,616.
Strain, Robert Joseph; and Thornber, Karvel Kuhn, 3,925,806.

Bell Telephone Labratories, Incorporated: *See—*
Mohsen, Amr Mohamed, 3,924,319.

Belliot, Christian; Cheylan, Etienne; Madelaine, Serge; and Ebbing, Johannes, to Compagnie Francaise Thomson Houston-Hotchkiss Brandt. Catalytic product for the oxidative destruction of gaseous organic compounds and method for their preparation. 3,925,535, Cl. 423-213.200.

Beloit Corporation: *See—*
Brenner, Lawrence A.; and Scholl, Charles H., 3,924,375.
Moore, Lawrence A., 3,924,998.

Bendix Corporation, The: *See—*
Brownell, Dudley C.; and Jackson, Harold W., 3,925,739.

Bendixen, Stein. Device for temporary storage of waste and storm water. 3,924,653, Cl. 137-236.000.

Beneze, Heinz W.: *See—*
Yang, James H. C.; and Beneze, Heinz W., 3,924,982.

Benigno, Paolo: *See—*
Primicerio, Fernando; and Benigno, Paolo, 3,924,742.

Benkoe, Erwin: *See—*
Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., 3,924,352.

Benner, Robert A.; Fisher, Philip H.; and Parlette, Carl L., to Owens-Illinois, Inc. Spraying apparatus. 3,924,565, Cl. 118-323.000.

Benner, Wolfgang. Steel edge. 3,924,865, Cl. 280-11.13N.

Bennett, John A.; and McAllister, Ian R., to Bennett Pollution Controls, Ltd. Oil containment boom. 3,924,412, Cl. 61-1.00F.

Bennett, John Charles, to Clarke Chapman-John Thompson Limited. Heat exchanger. 3,924,676, Cl. 165-172.000.

Bennett Pollution Controls, Ltd.: *See—*
Bennett, John A.; and McAllister, Ian R., 3,924,412.

Bentz, Francis: *See—*
Velker, Eugen; Bentz, Francis; and Nischk, Gunther, 3,925,515.
Wolf, Gerhard Dieter; Kunzel, Hans Egon; Blankenstein, Gunther; Kleinschmidt, Peter; and Bentz, Francis, 3,925,310.

Bergishagen, Finn; and Schmidt, James J., to Dana Corporation; and Product-Sol, Inc. Method of removing brittle lacquer stress coatings and stripping compositions therefor. 3,924,455, Cl. 73-88.000.

Bergman, Steven C.; Gnirrep, Thomas B.; and Nazzaro, Charles A., to Hoffmann-La Roche Inc. System controller for use with radiological assay system. 3,925,644, Cl. 235-151.300.

Berkey Photo, Inc.: *See—*
Booth, Walter A., 3,925,795.

Berman, Paul A.; Giras, Theodore C.; and Crews, Roy E., to Westinghouse Electric Corporation. Modular operating centers and methods of building same for use in electric power generating plants and other industrial and commercial plants, processes and systems. 3,925,679, Cl. 290-1.000.

Bernard, Jacques Leon, to Centre National d'Etudes Spatiales. Apparatus for the formation of coatings on a substratum. 3,925,187, Cl. 204-298.000.

Bernard, James K.; and Sollazzi, Pasquale Robert, to Rapid-American Corporation. Luggage with binding strip and method of making same. 3,924,714, Cl. 190-18.00R.

Bernert, Claus-Rudiger; and Radlmann, Eduard, to Bayer Aktiengesellschaft. Polyamide compositions which have been rendered antistatic by the addition of sulfocarboxylic acid amides. 3,925,321, Cl. 260-78.00S.

Bernier, Louis E.; and Giblin, James P., to E. T. Wright & Co., Inc. Method for making shoes with cleated bottoms. 3,925,529, Cl. 264-244.000.

Bertelli, Italo: *See—*
Tangorra, Giorgio; Bertelli, Italo; and Calori, Giovanni, 3,924,670.

Berthmann, Adolf; Martin, Gerhard; and Klunsch, Maximilian, to Dynamit Nobel Aktiengesellschaft. Molded explosive bodies having variable detonation speeds. 3,925,122, Cl. 149-2.000.

Berwin, Ted W.; and Wilbur, Everett T., to Hughes Aircraft Company. Digital raster rotator. 3,925,765, Cl. 340-172.500.

Besier, Mattheus: *See—*
Wiemer, Willem; and Besier, Mattheus, 3,925,038.

Besse, Michael E.: *See—*
Lechner, Thomas G.; and Besse, Michael E., 3,925,087.

Bessiere, Pierre Etienne, to Labavia S.G.E. Vehicle braking devices. 3,924,713, Cl. 188-296.000.

Bethlehem Steel Corporation: *See—*
Mantione, Anthony F., 3,924,543.

Betts, Joseph Elwood; Ott, William Michael, Jr.; and Vaum, Howard Thomas, to General Electric Company. Apparatus for maintaining a pressurized liquid-gas interface within a conduit. 3,924,985, Cl. 425-72.000.

Betts, Paul J., to Inter Dyne. Laboratory counter top and fittings therefor. 3,924,880, Cl. 285-61.000.

Betzing, Hans; and Lekim, Dac, to A. Nattermann & Cie. GmbH. Process of manufacturing enzyme preparation rich in lipase. 3,925,158, Cl. 195-66.00R.

Bhate, Suresh K.; Spreadbury, Robert J.; Walker, Michael S.; and Young, Frederick J., to Westinghouse Electric Corporation. High voltage current limiting circuit breaker utilizing a super conductive resistance element. 3,925,707, Cl. 317-11.00A.

Bhutani, Harish K.: *See—*
Kendall, Giles A.; Bhutani, Harish K.; and Minick, Robert, 3,924,511.

Bigham, Clifford B.; and Schneider, Harvey R., to Atomic Energy of Canada Limited. Superconducting cyclotron neutron source for therapy. 3,925,676, Cl. 250-499.000.

Billings, William W.: *See—*
Mitchell, James T.; and Billings, William W., 3,925,709.

Bingham, Paul E.: *See—*
Droegemueller, William; Eberhardt, Ralph N., Jr.; and Bingham, Paul E., 3,924,628.

Binsbergen, Frederik L.: *See—*
Kohler, Jacques R.; and Binsbergen, Frederik L., 3,925,514.

Bither, Tom Allen, Jr., to Du Pont de Nemours, E. I., and Company. Metal boracites. 3,925,537, Cl. 423-277.000.

Bittner, Franklin C. Apparatus and process for plugging a paper roll core. 3,924,743, Cl. 206-389.000.

Black Clawson Company, The: *See—*
Marsh, Paul G., 3,925,150.

Black, Sivalls & Bryson, Inc.: *See—*
Ebeling, Harold O., 3,924,574.

Blackburn, Richard D.: *See—*
Fohrhaltz, Howard A.; and Blackburn, Richard D., 3,925,722.

Blair, Murray R., Jr.: *See—*
Adams, Herbert H. F.; Anderson, Jon C.; Blair, Murray R., Jr.; DiRubio, Robert L.; and Takman, Bertil H., 3,925,469.

Blankenship, James O., to Long Mile Rubber Company. Tire retreading system. 3,925,129, Cl. 156-96.000.

Blankenship, Owen D., to Global Marine Inc. Air cushion dredge for use in ice-covered waters. 3,924,896, Cl. 299-18.000.

Blankenstein, Gunther: *See—*
Wolf, Gerhard Dieter; Kunzel, Hans Egon; Blankenstein, Gunther; Kleinschmidt, Peter; and Bentz, Francis, 3,925,310.

Blanz, Roland: *See—*
Grau, Dietrich; Beigel, Franz; and Blanz, Roland, 3,924,544.

Bleday, Michael P.; and Youngren, Fred R., to United States of America, Army. Radome heat shield. 3,925,783, Cl. 343-705.000.

Blewitt, Donald D., to Westinghouse Electric Corporation. High voltage fuse with localized gas evolving suppressors. 3,925,745, Cl. 337-279.000.

Bliss, Richard D., to Riverside Bio-Engineering, Inc. Analog-recording apparatus for recording and derandomizing randomly-occurring data. 3,925,604, Cl. 178-6.60R.

Bloch, David R. Propeller mechanism for boats. 3,924,557, Cl. 115-38.000.

Blom, Hendrik; and Mollet, Prudent Eduardus Jacobus, to U.S. Philips Corporation. Colour television camera including a position corrector for at least two scanning rasters in the camera. 3,925,812, Cl. 358-51.000.

Bloom, Ray A.; and Phillips, Herbert L., to Timken Company, The. Compact containing iron oxide and carbon and method for its use in steelmaking. 3,925,060, Cl. 75-11.000.

Bluemle, Albert W.: *See—*
Stone, Jonathan A.; and Bluemle, Albert W., 3,925,296.

Blume, Philip, to United States of America, Health, Education and Welfare. Automated system for the determination of bacterial antibiotic susceptibilities. 3,925,166, Cl. 195-139.000.

Blumer, Larry D.: *See—*
Walker, Frank H.; Blumer, Larry D.; Khouri, Robert N.; and Fulks, David G., 3,924,483.

Blurton, Keith F.: *See—*
Oswin, Harry G.; and Blurton, Keith F., 3,925,183.

Boardman, Harold; Breslow, David S.; Simpson, David A.; and Wagner, Richard L., to Hercules Incorporated. Preparing lithographic plates utilizing vinyl monomers containing hydrolyzable silane groups. 3,924,520, Cl. 96-33.000.

Bobkowicz, Andrew John: *See—*
Bobkowicz, Emilian; Bobkowicz, Andrew John; and Lefebvre nee Bobkowicz, Margaret Mary, 3,924,396.

Bobkowicz, Emilian; Bobkowicz, Andrew John; and Lefebvre nee Bobkowicz, Margaret Mary. Composite yarn forming method and apparatus. 3,924,396, Cl. 57-35.000.

Bochorishvili, Anzor Ippolitovich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Chekotilo, Leonty Vasilievich; Martyn, Viktor Mikhailovich; Artamonov, Viktor Leonidovich; Bochorishvili, Anzor Ippolitovich; Stupak, Leonid Mikhailovich; Sysenko, Anatoly Petrovich; and Popov, Valery Georgievich, 3,924,672.

Bock, Hartmut, to Hoechst Aktiengesellschaft. Method of measuring the toner concentration of a developer circulating in an electrophotographic reproduction machine. 3,924,462, Cl. 73-150.00R.

Bockmann, August; Teichmann, Gunter; and Rudolph, Hans, to Bayer Aktiengesellschaft. Free-flowing dispersible inorganic pigment of filler compositions containing hydroxyalkylate alkylene diamines. 3,925,095, Cl. 106-308.00N.

Boden, Heinrich: *See—*
Althausen, Ferdinand; Boden, Heinrich; Ersfeld, Heinz; Klier, Lothar; Raffel, Reiner; and Schneider, Walter, 3,924,989.

Boehmke, Gunther, to Bayer Aktiengesellschaft. Emulsifying carrier compositions and process for emulsifying carriers containing hydroxyaryl groups. 3,925,011, Cl. 8-169.000.

Boehmke, Gunther; and Theidel, Hans, to Bayer Aktiengesellschaft. Pyrazoline brighteners. 3,925,367, Cl. 260-239.650.

Boehmke, Gunther; and Theidel, Hans, to Bayer Aktiengesellschaft. Triazole-coumarins. 3,925,405, Cl. 260-308.00R.

Boehringer Ingelheim GmbH: *See—*
Koppe, Herbert; Kummer, Werner; Stahle, Helmut; and Muacevic, Gojko, 3,925,446.

Boehringer Mannheim G.m.b.H.: *See—*
Beaucamp, Klaus; Mollering, Hans; Lang, Gunter; Gruber, Wolfgang; and Roeschlau, Peter, 3,925,164.

Boeing Company, The: *See—*
Kofoid, Melvin J., 3,925,177.

Boggs, Fred: *See—*
Thomas, Wil B.; and Boggs, Fred, 3,924,573.

Bohner, Beat: *See—*
Pissiotas, Georg; Meyer, Willy; Bohner, Beat; and Drabek, Jozef, 3,925,517.

Bojarska-Dahlig, Halina; and Szypka, Zdzislaw, to Instytut Przemysku Farmaceutycznego. L-aspartate of cyclic erythromycin a carbonate and process of preparing the same. 3,925,352, Cl. 260-210.00E.

Boliden Aktiebolag: *See—*
Fahlstrom, Per Anders Herman Henningsson; and Jonsson, Erik Alfon, 3,924,814.

Boll, Dietmar: *See—*
Reis, Walter; and Boll, Dietmar, 3,924,754.

Boller, Arthur; and Scherrer, Hanspeter, to Hoffmann-La Roche Inc. Liquid crystalline isonitriles. 3,925,444, Cl. 260-463.000.

Bolsing, Friedrich. Cleaning composition containing phosphoric acid, a process for its manufacture and its uses. 3,925,229, Cl. 252-136.000.

Bond, Helen Inez. Therapeutic prop-like support for hemiside reclining persons. 3,924,282, Cl. 5-327.00R.

Bond, William D.; and Zemke, Bruce E., to General Motors Corporation. Quick warm-up intake manifold. 3,924,591, Cl. 123-122.00H.

Bondy, Harry L.: *See—*
Lowe, William F.; and Bondy, Harry L., 3,925,144.

Boney, William G.; and Kuchar, Paul J., to Universal Oil Products Company. Alkylation process. 3,925,502, Cl. 260-683.480.

Boni, Raymond L.: *See—*
Rauch, Marvin A.; Boni, Raymond L.; and Hadnagy, Thomas D., 3,924,332.

Bono, Pierre; Demange, Philippe; Leclere, Claudine; and Tissier, Alexis, to Societe Generale de Constructions Electriques et Mecaniques "Alsthom & Cie". Fuel cell with a decarbonation cycle, consuming a mixed fuel. 3,925,099, Cl. 136-86.00C.

Booth, Walter A., to Berkey Photo, Inc. Mechanism for controlling the positioning of a diaphragm within a camera. 3,925,795, Cl. 354-139.000.

Borck, Joachim: *See—*
Dahm, Johann; Borck, Joachim; Nowak, Herbert; Zimane, Zdenek; and Kayser, Detlev, 3,925,394.

Borden, Inc.: *See—*
Hollingsworth, Clinton Allen; and Snyder, John Harold, 3,925,024.

Bornhoffer, Frank G. Flexible hose storage container. 3,924,661, Cl. 138-110.000.

Borretzen, Bernt; Olsson, Knut Gunnar; and Sundbeck, Bertil, to AB Ferrosan. Substituted diphenyl ethene. 3,925,487, Cl. 260-619.00A.

Borzym, John J., to Alpha Industries, Inc. Clamping die jaw insert for tube cutoff apparatus. 3,924,502, Cl. 83-454.000.

Boser, Ronald; and Gluckin, Gerald. Stop control motor for a sewing machine. 3,924,550, Cl. 112-130.000.

Bossert, Friedrich: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,925,395.

Botterman, David L.: *See—*
Bell, Richard L.; Walter, Richard T.; Botterman, David L.; and Lewis, Philip W., 3,924,736.

Boundy, Bruce K., to Westinghouse Electric Corporation. Even load clip. 3,924,829, Cl. 248-243.000.

Bourassin, Rene, to Commissariat a l'Energie Atomique. Dampened vertical spindle. 3,924,910, Cl. 308-156.000.

Bousmar, Michel Antony Marie Joseph, to U.S. Philips Corporation. Receiver for the reception of pulse signals transmitted by means of frequency shift modulation. 3,925,614, Cl. 178-88.000.

Boustred, Brian Malcolm: *See—*
Pedlar, Roy; and Boustred, Brian Malcolm, 3,924,342.

Bowman, Raymond D., to Cavalier Corporation. Vending machine electrical operating control circuit. 3,924,719, Cl. 194-10.000.

Bowthorpe Hellermann Limited: *See—*
McCormick, Mathew, 3,924,299.

Boyden, Robert E.: *See—*
Link, Gustav A.; and Boyden, Robert E., 3,925,683.

Brabants, Jules Anthony Peter: *See—*
Robertson, Malcolm Eric Alexander; Marshall, John; Brabants, Jules Anthony Peter; and Davies, Michael Edward, 3,925,665.

Bradley, Robert C.; and Fulton, Garland L., to Multi-Metal Wire Cloth Inc. Strainer valves. 3,925,209, Cl. 210-304.000.

Brainard, Ralph Carter; and Candy, James Charles, to Bell Telephone Laboratories, Incorporated. Differential pulse coded system using shift register companding. 3,925,731, Cl. 325-38.00B.

Brandli, Gerold; and Keller, Pierre, to BBC Brown Boveri & Company Limited. Apparatus for measuring surface temperatures of objects by infrared radiation therefrom. 3,924,469, Cl. 73-355.0EM.

Brannstrom, Kurt Osten; and Karlfors, Levi Johannes, to Atlas Copco Aktiebolag. Combustion engine driven hammer machines. 3,924,691, Cl. 173-48.000.

Braverman, Milton. Closure for multicompartment medicinal dispensing device. 3,924,748, Cl. 206-534.100.

Bray, Martin L.; Cole, Edward N.; and Haggart, James A., Jr., to General Motors Corporation. Spring loaded catalytic converter with externally mounted spring. 3,925,026, Cl. 23-288.0FC.

Bray, Stewart V., to Ford Motor Company. Spark plug socket wrench. 3,924,492, Cl. 81-121.00R.

Brechbuhler, Hans U.: *See—*
von Bredow, Brigitta; and Brechbuhler, Hans U., 3,925,379.

Brecht, Heinz; and Hoffmann, Dieter, to Hoechst Aktiengesellschaft. Fluorinated urethane-N-sulfonic acid esters. 3,925,438, Cl. 260-456.00A.

Breen, Bernard P.: *See—*
Kerho, Stephen E.; Lindquist, Claude S.; White, John R.; and Breen, Bernard P., 3,924,442.

Breidbach, Gunter: *See—*
Ringel, Paul; Hildebrand, Dietrich; and Breidbach, Gunter, 3,925,012.

Breitenfellner, Franz; and Eberle, Wolfgang, to Ciba-Geigy Corporation. Transparent laminate films of polyolefines and polyesters and processes for their manufacture. 3,925,591, Cl. 428-483.000.

Breitling, Ulrich; and Simon, Klaus, to Krauss-Maffei Aktiengesellschaft. Electromagnetic-suspension vehicle system. 3,924,538, Cl. 104-148.0MS.

Breland, Dorothy S. Brush having a head of gathered net material. 3,924,288, Cl. 15-225.000.

Breland, John G.: *See—*
Arnold, Fred E.; Breland, John G.; and Villaescusa, Frank W., 3,925,311.

Brennan, John William, Jr. Foldable furniture hinge member. 3,924,890, Cl. 297-16.000.

Brenner, Lawrence A.; and Scholl, Charles H., to Beloit Corporation. Automatic crimper. 3,924,375, Cl. 53-380.000.

Breslow, David S.: *See—*
Boardman, Harold; Breslow, David S.; Simpson, David A.; and Wagner, Richard L., 3,924,520.

Bresnick, Herbert L.: *See—*
Smith, Richard E.; and Bresnick, Herbert L., 3,924,944.

Brewer, George E. F., to Grow Chemical Corporation. Method of spraying a powder paint slurry. 3,925,580, Cl. 427-372.000.

Brewer, Robert W., to General Motors Corporation. Viscous fluid clutch with centrifugal clutch. 3,924,716, Cl. 192-57.000.

Brickman, W. James; and Faessinger, Robert W., to Scott Paper Company. Abrasion resistant cellulosic fabrics containing graft polymerized diethylphosphatoethylmethacrylate and/or diethylphosphatoethyl acrylate. 3,925,274, Cl. 260-17.4GC.

Bristol-Myers Company: *See—*
Williams, Walter A.; and Silvestri, Herbert H., 3,925,418.
British Aircraft Corporation Limited: *See—*
Summers, Leo Ewart Arthur; and Underhill, David Sidney, 3,924,793.
British Industrial Plastics Limited: *See—*
Lynex, Graham; and Tranter, Harold, 3,924,811.
British Petroleum Company Limited, The: *See—*
Webb, Alan David, 3,925,592.
British Steel Corporation: *See—*
Crownshaw, Robert; and Jubb, Ronald, 3,924,358.
British Titan Limited: *See—*
Moss, John Hickman; and Leng, Barrie, 3,925,531.
Broderick, Frank William, to Standex International Corporation. Metal applicator roll. 3,924,313, Cl. 29-121.00R.
Broderick, Ross Thomas: *See—*
Wagner, Joseph Francis; Broderick, Ross Thomas; Link, Joseph Edward; and Stover, David Emmert, 3,924,904.
Brodie, Peter M.; and Solov, Edwin G., to Singer Company, The. Cross track strapdown inertial quidance system. 3,924,824, Cl. 244-3.200.
Brodrene Gram A/A: *See—*
Gram, Hans, 3,924,758.
Brogli, Hans G.; and Brogli, Werner F. Apparatus for the manufacture of emulsions. 3,925,243, Cl. 252-359.00C.
Brogli, Werner F.: *See—*
Brogli, Hans G.; and Brogli, Werner F., 3,925,243.
Brokenshire, John Leslie: *See—*
Showalter, Lane Crawford; Brokenshire, John Leslie; and Watts, Geoffrey Brian, 3,925,022.
Brooke, Alan H.: *See—*
Tu, Peter K. C.; Brooke, Alan H.; and Miller, Frank S., 3,925,044.
Brooke, Dana, to Mead Johnson & Company. Zero-order release method. 3,924,622, Cl. 128-260.000.
Brosh, Amnon: *See—*
Kurtz, Anthony D.; Brosh, Amnon; Gravel, Charles L.; and Mallon, Joseph R., 3,924,322.
Brown, Albert E.; Schlotzhauer, Allan T.; and Newman, Douglas A., to Columbia Ribbon and Carbon Manufacturing Co., Inc. Pressure-adhesive correction materials and method for producing same. 3,924,728, Cl. 197-172.000.
Brown, Alfred: *See—*
Wu, Ching H.; Brown, Alfred; Huang, Wann-Sheng; and Shum, Yick-Mow, 3,924,682.
Brown, Anna P., to Brown, Anna P.; Brown, Joseph S.; and Brown, Richard A. R. J., part interest to each. Artist's paintbrush. 3,924,287, Cl. 15-192.000.
Brown, Boveri & Cie. A.G.: *See—*
Brungsberg, Heinrich-Josef, 3,924,595.
Brown, Buck C., to Presearch Incorporated. Method and apparatus for detecting a repetitive signal in a noisy background. 3,925,650, Cl. 235-164.000.
Brown, Edward L.: *See—*
Totman, Mirrel L., 3,924,649.
Brown, Gaylord W., to Koehring Company. Fabricating apparatus for twin-sheets. 3,925,140, Cl. 156-382.000.
Brown, Henry L., Jr.: *See—*
Everhardt, William F.; Brown, Henry L., Jr.; and Dennis, Clement O., Sr., 3,925,005.
Brown, Joseph S.: *See—*
Brown, Anna P., 3,924,287.
Brown, Martin John: *See—*
Austin, James Raymond; Brown, Martin John; and Loan, Leonard Donald, 3,925,671.
Brown, Melancthon S., deceased; and by Kohn, Gustave K., administrator, to Chevron Research Company. Herbicidal bis-urea and urea-carbamoyl sulfides. 3,925,056, Cl. 71-98.000.
Brown, Richard A. R. J.: *See—*
Brown, Anna P., 3,924,287.
Brown, Robert, to Nairn Floors Limited. Production of bonded fibrous products. 3,925,130, Cl. 156-148.000.
Brown, William R., to FMC Corporation. Two mass swing system with independently controlled vibratory exciter means. 3,924,730, Cl. 198-220.00R.
Brown & Williamson Tobacco Corporation: *See—*
Summers, Thomas Wade, 3,924,643.
Brownell, Dudley C.; and Jackson, Harold W., to Bendix Corporation, The. Radio frequency notch filter. 3,925,739, Cl. 333-76.000.
Bruce, Jack William: *See—*
Singleton, Frank Henry; and Bruce, Jack William, 3,925,534.
Bruen, Charles P.; and Kelly, Donald H., to Reynolds Metals Company. Process for producing alumina monohydrate from basic aluminum nitrates. 3,925,538, Cl. 423-390.000.
Bruker-Physik AG: *See—*
Haas, Jorg, 3,925,786.
Brundage, Ruth Pauline: *See—*
Lesher, George Y.; and Brundage, Ruth Pauline, 3,925,398.
Brungsberg, Heinrich-Josef, to Brown, Boveri & Cie. A.G. Automatic turn-off for transistorized ignition systems for internal combustion engines. 3,924,595, Cl. 123-148.00E.
Brunie, Jean-Claude; Creene, Noel; and Maurel, Felix, to Rhone-Poulenc S.A. Process for the preparation of mixtures of cycloalkanols and cycloalkanones. 3,925,316, Cl. 260-586.00R.
Bruning, Klaus; and Lob, Heinrich, to Dynamit Nobel AG. Mixing device for curable liquid material. 3,924,836, Cl. 259-7.000.
Brunswick Corporation: *See—*
Hundertmark, James M., 3,924,975.
Brych, Alfred: *See—*
Lehmann, Gerard; and Brych, Alfred, 3,925,101.
Bucalo, Louis. Device for testing for the presence of micro-organisms. 3,924,607, Cl. 128-2.00W.
Buchel, Karl Heinz; Frohberger, Paul-Ernst; Scheinpflug, Hans; and Enders, Edgar, to Bayer Aktiengesellschaft. 2-Substituted phenylhydrazonoimidazolenine fungicidal and bactericidal agents. 3,925,551, Cl. 424-273.000.
Buckle, Derek Richard; and Smith, Harry, to Beecham Group Limited. Anti-allergic pharmaceutical compositions. 3,925,557, Cl. 424-331.000.
Buder, Gus A.: *See—*
Cave, Ellis K., 3,925,184.
Budzyna, Edward S., to Rockwell International Corporation. Weft cutter control apparatus. 3,924,662, Cl. 139-302.000.
Buehler, Arthur; and Schuetz, Hans-Ulrich, to Ciba-Geigy AG. Mixed chromium-containing azo dyestuffs containing, per atom of chromium, one molecule of an o,o'-dihydroxy-sulphophenylene-azo-naphthalene and one molecule of an -o-hydroxyphenylene-azo-acetoacetamide. 3,925,346, Cl. 260-145.00A.
Bugaut, Andree: *See—*
Kalopissis, Gregoire; Bugaut, Andree; and Zorayan, Vahan, 3,925,474.
Buhne, Gerd, to Titan Verpackungssysteme GmbH. Device for applying strapping material to round packages or the like. 3,924,526, Cl. 100-25.000.
Buller, Joseph S.; Eneim, Arthur A.; and Hitzelberger, David A., to Hughes Aircraft Company. Quick disconnect tank coupler. 3,924,654, Cl. 137-322.000.
Bultman, John D.; Jurd, Leonard; and Ritchie, Donald D., to United States of America, Navy. Use of obtusaquinone as a fungicide to control wood-inhabiting marine fungi. 3,925,558, Cl. 424-331.000.
Bumberger, Dietrich, to Hoechst Aktiengesellschaft. Sealing device. 3,924,911, Cl. 308-187.100.
Bumpus, Francis Merlin; Khosla, Mahesh Chandra; and Smeby, Robert Rudolph. [Sar^1,Thr^8]angiotensin II as an angiotensin antagonist. 3,925,345, Cl. 260-112.500.
Burg, Karlheinz: *See—*
Sextro, Gunter; and Burg, Karlheinz, 3,925,505.
Burgess, William P., to Mobil Oil Corporation. Hydrocarbon conversion over activated erionite. 3,925,191, Cl. 208-111.000.
Burkle, Fritz, Jr., to Fritz Burkle KG, Firma. Link bracelet construction, particularly watch bracelet. 3,924,418, Cl. 63-4.000.
Burroughs Corporation: *See—*
Millben, Lawrence A., 3,925,723.
Reynolds, Robert J., 3,924,721.
Burrows, John: *See—*
Harris, Arthur; Burrows, John; and Hargreaves, James Roger, 3,925,245.
Burton, Arthur William: *See—*
Barnett, Barry Roger Michael; and Burton, Arthur William, 3,924,955.
Busch, Peter: *See—*
Story, Paul R.; and Busch, Peter, 3,925,417.
Story, Paul Richard; Busch, Peter; Denson, Donald Derby; and Wright, Carl Edward, 3,925,421.
Business Electronics, Inc.: *See—*
Beacham, Ronald; Covington, Dennis; and McNutt, Reginald, 3,925,770.
Bussard, Charles B.; Hamisch, Paul H., Sr.; and Wisecup, David R., to Monarch Marking Systems, Inc. Pinning machine and method. 3,924,523, Cl. 93-87.000.
Butcher, Thomas V.; and Stitt, Donald H. Bumpers for vehicles. 3,924,888, Cl. 293-76.000.
Butler National Corporation: *See—*
Gilbert, Glen A.; and Hobbs, James, 3,925,750.
Butzky, Leon: *See—*
Sperry, Philip R.; Tyler, Derek E.; and Butzky, Leon, 3,925,067.
Buza, Thomas Brian: *See—*
Zipperian, Donald Edwin; Jones, James Allen; and Buza, Thomas Brian, 3,925,218.
Buzzelli, Edward S., to Westinghouse Electric Corporation. Metal/air cells and air cathodes for use therein. 3,925,100, Cl. 136-86.00A.
Buzzi, Gian Fausto: *See—*
Ferlazzo, Natale; Buzzi, Gian Fausto; and Ghirga, Marcello, 3,925,463.
Buzzolini, Mario Gustav; and Manning, Robert Everett, to Sandoz-Wander, Inc. α-(p-benzyloxyphenyl)-p-cresol. 3,925,483, Cl. 260-613.00R.
BWB Controls, Inc.: *See—*
Hoofnagle, Frank M., 3,924,752.
BWG Bergwerk- und Walzwerk-Maschinenbau GmbH, Firma: *See—*
Noe, Oskar, 3,924,428.
C. Conradty: *See—*
Lauterbach-Dammler, Inge, 3,925,261.
C. Reichert Optische Werke, AG: *See—*
Merstallinger, Kurt; and Schindl, Klaus P., 3,924,926.
Cacossa, Frank: *See—*
Guarino, Michael C.; and Cacossa, Frank, 3,924,369.
Cady, Edward W.; and Parsons, George R., to Aluminum Company of America. Apparatus for removing pilferproof closure bands from returnable bottles. 3,924,315, Cl. 29-200.00D.
Cain, James F., to Marlboro Manufacturing Inc. Hinge structure. 3,924,293, Cl. 16-169.000.

Caldwell, Samuel I.; Orr, Robert S.; and White, Duane D., to Caterpillar Tractor Co. Final drives with load separating means. 3,924,485, Cl. 74-410.000.
Calori, Giovanni: *See—*
Tangorra, Giorgio; Bertelli, Italo; and Calori, Giovanni, 3,924,670.
Cama, Lovji D., to Merck & Co., Inc. Process for epimerizing penicillin compounds, and related products. 3,925,363, Cl. 260-239.100.
Cameli, Nazzareno: *See—*
Valvassori, Alberto; Sartori, Guido; and Cameli, Nazzareno, 3,925,333.
Camic, Donald L., to Hughey and Phillips, Inc. Lighting system with variable flashing rate. 3,925,704, Cl. 315-200.00A.
Camille Bauer Messinstrumente AG: *See—*
Ludin, Ludwig, 3,924,528.
Camosso, Domenico, to SKF Industrial Trading and Development Company B.V. Locking arrangement for bearing rings. 3,924,957, Cl. 403-352.000.
Campagna, Edward R.: *See—*
Arrandale, Roy S.; and Campagna, Edward R., 3,924,767.
Canada, Atomic Energy of, Limited: *See—*
Allan, Colin J.; and Bayly, John G., 3,925,666.
Canadian Patents and Development Limited: *See—*
Dawson, Peter H., 3,925,662.
Candle, Richard D., to Goodyear Tire & Rubber Company, The. Inflatable shelter. 3,924,363, Cl. 52-2.000.
Candy, James Charles: *See—*
Brainard, Ralph Carter; and Candy, James Charles, 3,925,731.
Canney, Robert S., to General Electric Company. End cap for primary windings. 3,925,744, Cl. 336-84.000.
Canning, Michael H., to International Harvester Company. Adjustable program control circuit for two hydraulic cylinders with single lever control. 3,924,766, Cl. 214-764.000.
Canon Kabushiki Kaisha: *See—*
Hirose, Ryusho, 3,924,933.
Matsumura, Isao; and Kohayakawa, Yoshimi, 3,925,793.
Sanada, Noriaki; and Sorimachi, Kanehiro, 3,925,798.
Yamada, Tateo; and Uchidoi, Masanori, 3,924,942.
Cape, Arthur T., to Coast Metals, Inc. Brazing alloy. 3,925,070, Cl. 75-159.000.
Carapellucci, Joseph, to Diamond Seven, Inc. Constant horsepower variable speed reversing transmission. 3,924,480, Cl. 74-230.17A.
Cardwell, Robert Edward; Davis, Robert Leon; Marino, Patrick John; and McNamara, Edward Joseph, to Bell Telephone Laboratories, Incorporated. Line switching system for digital data. 3,925,600, Cl. 178-3.000.
Cardwell, Robert Edward; Carlson, David Emory; Davis, Robert Leon; McNamara, Edward Joseph; Pilc, Randolph John; Schlanger, Gabriel Gary; Tutelman, David Morris; Warwick, Peter Stephen; and Zydney, Herbert Mortimer, to Bell Telephone Laboratories, Incorporated. Digital register sender and line circuit for data switch. 3,925,601, Cl. 178-3.000.
Caretta, Renato, to Industrial Pirelli S.p.A. Machine for manufacturing pneumatic tires, in particular radial tires. 3,925,141, Cl. 156-416.000.
Carl Schenck AG, Firma: *See—*
Maus, Otfrid, 3,924,473.
Carleton Controls Corporation: *See—*
Cummins, Richard D., 3,924,464.
Carleton, Peter S.; Lockwood, Robert J.; and Reymore, Harold E., Jr., to Upjohn Company, The. Polyisocyanate-based foam process using aminimides as catalyst. 3,925,284, Cl. 260-2.5AC.
Carlone, Eugene R. Wrist-actuatable switch. 3,924,400, Cl. 58-50.00R.
Carlson, David Emory: *See—*
Cardwell, Robert Edward; Carlson, David Emory; Davis, Robert Leon; McNamara, Edward Joseph; Pilc, Randolph John; Schlanger, Gabriel Gary; Tutelman, David Morris; Warwick, Peter Stephen; and Zydney, Herbert Mortimer, 3,925,601.
Carlsson, Lars Erik; Grevillius, Nils Fredrik; and Hellner, Lars Ivar, to Allmanna Svenska Elektriska Aktiebolaget. Steel manufacture. 3,925,061, Cl. 75-58.000.
Carmichael, Donald C.; Chambers, Douglas L.; and Wan, Chong T., to Shatterproof Glass Corporation. Method for continuous production of sputter-coated glass products. 3,925,182, Cl. 204-192.000.
Carpenter, Donald E.: *See—*
Baimbridge, Charles L.; Minderhout, James R.; Bearman, Robert W.; and Carpenter, Donald E., 3,925,169.
Carpi, Carlo; Dorigotti, Luciano; and Pifferi, Giorgio, to I.S.F. S.p.A. 6-Substituted 3-carbethoxyhydrazinopyridazine. 3,925,381, Cl. 260-250.00A.
Carr-Brion, Kenneth Garfield, to National Research Development Corporation. Analysis of moving fluids. 3,925,661, Cl. 250-272.000.
Carson, James W. Remotely controlled day-night outside truck mirror. 3,924,938, Cl. 350-302.000.
Carter, James L.: *See—*
Sinfelt, John H.; and Carter, James L., 3,925,196.
Carter, Ronald David, to Stanley Tools Ltd. Hand tool comprising a handle and removable blade. 3,924,329, Cl. 30-339.000.
Casad, Burton M.: *See—*
Clark, Charles R.; Gregory, M. Duane; Casad, Burton M.; Krehbiel, Delmar D.; and Kennedy, Carl D., 3,924,681.
Casio Computer Co., Ltd.: *See—*
Kashio, Toshio, 3,925,641.
Kashio, Toshio, 3,925,788.
Kashio, Toshio, 3,925,789.
Suzuki, Masahiko, 3,925,787.
Cassimally, K. A. I. Orthodontic device. 3,924,621, Cl. 128-252.000.
Catawba Chemicals, Inc.: *See—*
Axon, Gordon L.; and Montezinos, Beverly K., 3,925,013.
Caterpillar Tractor Co.: *See—*
Caldwell, Samuel I.; Orr, Robert S.; and White, Duane D., 3,924,485.
Jardin, Thomas K., 3,924,583.
Purcell, Robert J., 3,924,703.
Cates, Robert E., to Marley Company, The. Opposed air path wet-dry cooling tower and method. 3,925,523, Cl. 261-151.000.
Cauceglia, Walter Bartholomew; Gerlt, Charles; and Peralta, Luis Arturo, to Bell Telephone Laboratories, Incorporated. Raised floor with clamped panel support. 3,924,370, Cl. 52-126.000.
Cavalier Corporation: *See—*
Bowman, Raymond D., 3,924,719.
Lindsey, James C., 3,924,779.
Cave, Ellis K., to Buder, Gus A. Electrolytic system for recovering metal from chemical solutions with controlled plating current. 3,925,184, Cl. 204-229.000.
Caveny, Leonard H.; and Summerfield, Martin, to United States of America, Air Force. Embedded porous element rocket motor. 3,924,406, Cl. 60-254.000.
Cekoric, Thomas, Jr.; and Yananton, Patrick Michael, to Hoffmann-La Roche Inc. Diagnostic device. 3,925,163, Cl. 195-103.50R.
Celanese Corporation: *See—*
Forschirm, Alex S.; and Wissbrun, Kurt F., 3,925,006.
Kimmel, Robert M.; Riggs, John P.; Swander, Robert W.; and Whitney, Wells, 3,925,524.
LaNieve, Herman L., 3,925,525.
Montgomery, Robert T., 3,925,134.
Park, Im Keun, 3,925,587.
Cellone, Luigi: *See—*
Baldassarri, Agostino; and Cellone, Luigi, 3,925,086.
Central Specialties Inc.: *See—*
Ballenger, William G., 3,924,751.
Centre d'Etudes Experimentales et Cliniques de Physio Biologie de Pharmacologie et d'Eutonologie: *See—*
Laborit, Henri, 3,925,153.
Centre National d'Etudes Spatiales: *See—*
Alouges, Aime Elie, 3,925,794.
Bernard, Jacques Leon, 3,925,187.
Cernocky, Jiri: *See—*
Kovar, Stanislav; Cernocky, Jiri; and Riha, Petr, 3,924,820.
Ceskoslovenska akademie ved: *See—*
Coupek, Jiri; and Gut, Vladimir, 3,925,267.
Chabardes, Pierre; Grard, Charles; and Schneider, Charles, to Rhone-Poulenc S.A. Process for the preparation of allylic alcohols. 3,925,485, Cl. 260-617.00R.
Chaires, Anne Marie; Ciconte, Jean Marie; Ett, Allen Harold; Hilliard, John Joseph; and Rosenbaum, Walter Steven, to International Business Machines Corporation. Binary reference matrix for a character recognition machine. 3,925,761, Cl. 340-146.3WD.
Chalmers, Alexander Michael; Jack, James; and Cook, Barry, to Ciba-Geigy Corporation. Piperidine derivatives. 3,925,376, Cl. 260-248.0CS.
Chambers, Douglas L.: *See—*
Carmichael, Donald C.; Chambers, Douglas L.; and Wan, Chong T., 3,925,182.
Chambers, Robert B. Conveyor scale with integrator. 3,924,699, Cl. 177-16.000.
Chance, Vernon B., Jr.: *See—*
Rolf, David A.; and Chance, Vernon B., Jr., 3,925,256.
Chang, Lung Ting; and Terry, Carol Ann, to Miles Laboratories, Inc. Microbiological process for preparing 2-substituted-4-(R)-hydroxy-cyclopentane-1,3-diones. 3,925,156, Cl. 195-51.00R.
Chapin, Nancy L., to Kay Laboratories, Inc. Flameless heat source for use therein for splicing cables. 3,924,603, Cl. 126-263.000.
Chapman, John H.; Smith, Randolph O.; and Josey, Verlon E., to Yara Engineering Corporation. Method and apparatus for clay beneficiating. 3,924,813, Cl. 241-4.000.
Chapman, Sydney G.: *See—*
Altman, Carl; Chapman, Sydney G.; and Satya, Akella V. S., 3,924,320.
Chase, Kenneth P.: *See—*
Roberts, Michael G.; and Chase, Kenneth P., 3,925,300.
Chauvette, Robert R., to Eli Lilly and Company. Alpha-aminoacyl-3-halo cephalosporins. 3,925,372, Cl. 260-243.00C.
Cheatum, Leo George, to Deere & Company. Adjustable crop compressor for a pickup mechanism. 3,924,391, Cl. 56-364.000.
Chekotilo, Leonty Vasilievich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Chekotilo, Leonty Vasilievich; Martyn, Viktor Mikhailovich; Artamonov, Viktor Leonidovich; Bochorishvili, Anzor Ippolitovich; Stupak, Leonid Mikhailovich; Sysenko, Anatoly Petrovich; and Popov, Valery Georgievich, 3,924,672.
Chemclean Corporation: *See—*
Livingston, Howard J.; and Esquenet, Bernard Etienne, 3,925,214.
Chemische Werke Huls Aktiengesellschaft: *See—*
Reich, Manfred; Muller, Wolfgang; and zur Hausen, Manfred, 3,925,490.
Cheng, Bao-Ding, to Colgate-Palmolive Company. Carbonate built detergents. 3,925,228, Cl. 252-110.000.
Cheng, Paul J., to Phillips Petroleum Company. Multistage cyclonic separator. 3,925,045, Cl. 55-345.000.
Cheo, Peter K., to United Technologies Corporation. Integrated optical signal processing system. 3,924,931, Cl. 350-160.00R.

Chernowitz, Maurice E. Sound card and sound apparatus suitable for multi-channel use. 3,925,814, Cl. 360-2.000.

Chesley, Ronald F.: *See—*
Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., 3,924,352.

Chevron Research Company: *See—*
Brown, Melancthon S., deceased; and Kohn, Gustave K., administrator, 3,925,056.
Franke, Hans G., 3,925.520.
Hodgson, Clive, 3,925,428.
Singer, Malcolm S., 3,925,553.

Cheylan, Etienne: *See—*
Belliot, Christian; Cheylan, Etienne; Madelaine, Serge; and Ebbing, Johannes, 3,925,535.

Cheysson, Philippe Jean-Marie; Verney, Paul Jean; and Coquard, Michel Alain, to Exxon Research & Engineering Company. Liquid separating equipment. 3,925,204, Cl. 210-73.000.

Chibata, Ichiro; Yamada, Shigeki; and Yamamoto, Masao, to Tanabe Seiyaku Co. Ltd. Preparation of optically active isomers of lysines. 3,925,454, Cl. 260-501.120.

Chiklis, Charles K., to Polaroid Corporation. Photographic products containing anti-reflection layer. 3,925,081, Cl. 96-72.000.

Chirico, Lorraine: *See—*
Holman, Frank Brouwer, 3,924,571.

Chisnall, David William: *See—*
Taylor, Christine; and Chisnall, David William, 3,924,348.

Choshi, Yasuo: *See—*
Murai, Koichi; Choshi, Yasuo; and Kobayashi, Toshiaki, 3,925,278.

Christensen, Carl O., to Roll-Rite Corporation. Anti-flutter caster. 3,924,292, Cl. 16-35.00D.

Christensen, David E., to Raymond Lee Organization, Inc., The, a part interest. Puzzle toy. 3,924,857, Cl. 273-113.000.

Christie, John James Watson, to Wilfrid Overton Limited. Latches. 3,924,884, Cl. 292-196.000.

Christmann, Marvin H.: *See—*
Olsen, Keith H.; and Christmann, Marvin H., 3,925,146.

Chrysler Corporation: *See—*
Ghosh, Subrata, 3,925,071.

Chuang, Vincent T., to Union Carbide Corporation. The reaction of chlorosilanes with unsaturated organic compounds. 3,925,434, Cl. 260-448.20E.

Chuang, Vincent T.: *See—*
Walsh, John J.; and Chuang, Vincent T., 3,925,093.

Chugai Seiyaku Kabushiki Kaisha: *See—*
Kanno, Takashi, 3,925,162.

Church & Dwight Co., Inc.: *See—*
Winston, Anthony E. B., 3,925,224.

Church, Peter K.; and Knutson, Oliver J., to Kaman Sciences Corporation. Ceramic treating process and product produced thereby. 3,925,575, Cl. 427-226.000.

Ciba-Geigy AG: *See—*
Buehler, Arthur; and Schuetz, Hans-Ulrich, 3,925,346.
Gurtler, Peter, 3,925,007.
Haase, Jaroslav, 3,925,016.
Wohlkonig, Alexander; Hindermann, Peter; Beffa, Fabio; and Hegar, Gert, 3,925,348.

Ciba-Geigy Corporation: *See—*
Breitenfellner, Franz; and Eberle, Wolfgang, 3,925,591.
Chalmers, Alexander Michael; Jack, James; and Cook, Barry, 3,925,376.
Ernst, Otto; Meyerhans, Konrad; and Kusenberg, Eugen, 3,924,737.
Fattinger, Volker, 3,925,040.
Harris, Arthur; Burrows, John; and Hargreaves, James Roger, 3,925,245.
Pissiotas, Georg; Meyer, Willy; Bohner, Beat; and Drabek, Jozef, 3,925,517.
Porret, Daniel; and Habermeier, Jurgen, 3,925,406.
Renner, Alfred; and Haug, Theobald, 3,925,314.
Stockinger, Friedrich; and Lohse, Friedrich, 3,925,407.
Tscharner, Christopher Johannes; Schwarz, Maurice Jacob; and Horlacher, Paul, 3,925,260.
von Bredow, Brigitta; and Brechbuhler, Hans U., 3,925,379.

Cibie Projecteurs: *See—*
Puyplat, Olivier, 3,924,290.

Ciconte, Jean Marie: *See—*
Chaires, Anne Marie; Ciconte, Jean Marie; Ett, Allen Harold; Hilliard, John Joseph; and Rosenbaum, Walter Steven, 3,925,761.

Cincinnati Milacron Chemicals Inc.: *See—*
Weisfeld, Lewis B.; and Witman, Robert C., 3,925,309.

Clark, Charles R.; Gregory, M. Duane; Casad, Burton M.; Krehbiel, Delmar D.; and Kennedy, Carl D., to Continental Oil Company. Method of using overbased crude oil as waterflood additive. 3,924,681, Cl. 166-270.000.

Clark Equipment Company: *See—*
Heggen, John P., 3,924,702.
McKenzie, Ian, 3,924,667.

Clark, James A., to Bausch & Lomb Incorporated. Method of and apparatus for aligning optical lenses. 3,924,936, Cl. 350-252.000.

Clark, John O.; Rafferty, James B.; and Schindler, Donald G., to United States Steel Corporation. Ultrasonic testing of tubing employing a spiral wave generator. 3,924,453, Cl. 73-67.80S.

Clark, Lloyd Douglas, to Pressman, D. R., a part interest. Electronic clock employing repeating sequential single digit display. 3,925,777, Cl. 340-336.000.

Clarke Chapman-John Thompson Limited: *See—*
Bennett, John Charles, 3,924,676.

Clarke, Fredric B., III, to Monsanto Company. Quaternary aminoalkylene phosphonic acids and method of preparation. 3,925,453, Cl. 260-501.120.

Classe, Anthony V.; and Mehn, Robert P., to IPCO Hospital Supply Corporation. Animal cage. 3,924,572, Cl. 119-17.000.

Clayton & Lambert Manufacturing Company: *See—*
Lambert, Charles F., Jr., 3,924,761.

Cleaveland, Charles M., to Westinghouse Electric Corporation. Power-conductor assembly and insulating supporting means therefor. 3,925,599, Cl. 174-150.000.

Cleff, Gunther. Bottle cap having a preshrunk foil portion. 3,924,771, Cl. 215-246.000.

Clemence, Francois; and Le Martret, Odile, to Roussel-UCLAF. Basic aluminum salt of 2-N-propyl-5-thiazole-carboxylic acid. 3,925,399, Cl. 260-299.000.

Clerk, Robert Cecil. Porting arrangements of axial piston pumps and motors. 3,924,515, Cl. 91-472.000.

Coast Metals, Inc.: *See—*
Cape, Arthur T., 3,925,070.

Coate Burial Vault, Inc.: *See—*
Yost, Kenneth J., 3,925,208.

Coates, Harold; Collins, John Desmond; and Siddiqui, Iftikhar Hussain, to Albright & Wilson Limited. Esters and mixtures thereof with organotin compounds. 3,925,246, Cl. 252-400.00R.

Coates, Vincent J.; and Welter, Leonard M., to American Optical Corporation. Field emission electron gun. 3,925,664, Cl. 250-310.000.

Coffman, Robert L.; and Shiffler, Richard W., to Union Carbide Corporation. Hydraulic fluids based on borate esters. 3,925,223, Cl. 252-78.000.

Cogne Macchine Tessili-Cognetex S.p.A.: *See—*
Grossi, Oscar, 3,924,395.

Cohen, Evelyn V.: *See—*
Cohen, Morris; Cohen, Evelyn V.; and Rubio, Alfred M., 3,924,501.

Cohen, Joseph; and Zimmerman, Gilbert A., to Aerojet-General Corporation. Solid propellants with stability enhanced additives of particulate refractory carbides or oxides. 3,924,405, Cl. 60-219.000.

Cohen, Morris; Cohen, Evelyn V.; and Rubio, Alfred M., to Model Builders, Inc. Cutting apparatus. 3,924,501, Cl. 83-404.300.

Cohen, Noal; Rosenberger, Michael; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Cyanoalkyl a-ring procursors. 3,925,420, Cl. 260-340.900.

Cohen, Robert S.; and Crites, Lila J., to Dover Chemical Corporation. Method for producing hydrates of sodium chlorophenate and hydrates produced thereby. 3,925,489, Cl. 260-623.00R.

Cohen, William D.; and Darcy, John J., to Redactron Corporation. Cartridge drive. 3,924,823, Cl. 242-198.000.

Colburn, John W., Jr.; Wood, Charles D., III; Mathis, Ronald J.; and Nye, Allan R., to Southwest Research Institute. Earth ripper employing repetitive explosions. 3,924,897, Cl. 299-36.000.

Cole, Edward N.: *See—*
Bray, Martin L.; Cole, Edward N.; and Haggart, James A., Jr., 3,925,026.

Coleman, William R., to Dehm, Darrell L., a part interest. Method and machine for axially aligning and welding continuous rail. 3,925,636, Cl. 219-104.000.

Colgate-Palmolive Company: *See—*
Bauman, Robert Andrew, 3,925,556.
Cheng, Bao-Ding, 3,925,228.
Donohue, John, 3,925,543.

Collard, Maurice A.; Cruchant, Serge Alfred; and Lafon, Jean-Louis. System for rigidly fixing an object to a support by means of thermally insulating tension ties, more particularly for astronomical radiometers. 3,924,830, Cl. 248-358.00A.

College, Michael A., to Kennametal Inc. Excavating tool. 3,924,697, Cl. 175-382.000.

Collins, Arthur A.; and Pedersen, Robert D., to Arthur A. Collins, Inc. Digital circuit switched time-space-time switch equipped time division transmission loop system. 3,925,621, Cl. 179-15.0AL.

Collins, John Desmond: *See—*
Coates, Harold; Collins, John Desmond; and Siddiqui, Iftikhar Hussain, 3,925,246.

Collo Rheincollodium Koln GmbH Werk Hersel: *See—*
Moroni, Rolf; Rinck, Friedrich Karl; and Ehlenz, Peter, 3,925,248.

Colt Industries Operating Corporation: *See—*
Kindl, George F., 3,924,338.

Columbia Ribbon and Carbon Manufacturing Co., Inc.: *See—*
Brown, Albert E.; Schlotzhauer, Allan T.; and Newman, Douglas A., 3,924,728.

Com Tel, Inc.: *See—*
Miller, Lowell E.; and Nielsen, Gail R., 3,925,772.

Commercial Solvents Corporation: *See—*
Hodge, Edward B., 3,925,423.

Commissariat a l'Energie Atomique: *See—*
Bourassin, Rene, 3,924,910.
Decret, Jean-Claude; Denis, Pierre; and Jourdan, Paul, 3,924,954.

Commonwealth Scientific and Industrial Research Organization: *See—*
Scott, Trevor William; and Hills, Geoffrey Dean Loftus, 3,925,560.

Community Blood Council of Greater New York, Inc., The: *See—*
Mazur, Abraham, 3,925,344.

Compagnie Francaise Thomson Houston-Hotchkiss Brandt: *See—*
Belliot, Christian; Cheylan, Etienne; Madelaine, Serge; and Ebbing, Johannes, 3,925,535.

Compagnie Generale d'Automatisme: *See—*
Raison, Michel, 3,924,666.

Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Maurice, Louis, 3,924,962.

Conibear, Frank R. Actuator for animal trap. 3,924,347, Cl. 43-90.000.

Connors, William P., to McDonnell Douglas Corporation. Grid lateral photodetector with gain. 3,925,658, Cl. 250-211.00J.

Conrad, Richard A., to Teledyne, Inc. Electrical connector. 3,924,915, Cl. 339-17.00F.

Conscale AB: *See—*
Flinth, Rune; and Nordstrom, Kjell, 3,924,729.

Constantikes, George J.; and Van Pool, Joe, to Phillips Petroleum Company. Removal of fluorides from catalytic reactor feed. 3,925,193, Cl. 208-91.000.

Container Corporation of America: *See—*
Bell, Richard L.; Walter, Richard T.; Botterman, David L.; and Lewis, Philip W., 3,924,736.
Desmond, John D.; and Hart, Joseph J., 3,924,800.
Gardner, Jeffrey M.; and Pilz, William M., 3,924,734.
Walter, Richard T., 3,924,385.

Contexo Limited: *See—*
Mould, Frank, 3,924,328.

Continental Can Company, Inc.: *See—*
Peyser, Harry A., 3,924,777.

Continental Oil Company: *See—*
Clark, Charles R.; Gregory, M. Duane; Casad, Burton M.; Krehbiel, Delmar D.; and Kennedy, Carl D., 3,924,681.

Continental Tapes, Incorporated: *See—*
Dahl, Rolf, 3,925,283.

Cook, Barry: *See—*
Chalmers, Alexander Michael; Jack, James; and Cook, Barry, 3,925,376.

Cook Inc.: *See—*
Cook, William A.; and Osborne, Thomas A., 3,924,633.

Cook, Koy B., Jr.; Davidson, Jimmy L.; Gibson, Joseph D.; and Patterson, Raymond B., III, to Harris Corporation. Radiation hardened mis devices. 3,924,321, Cl. 29-580.000.

Cook, William A. Fiber glass reinforced catheter. 3,924,632, Cl. 128-348.000.

Cook, William A.; and Osborne, Thomas A., to Cook Inc. Apparatus and method for suprapubic catheterization. 3,924,633, Cl. 128-349.00R.

Cooley, Howard H., Jr. Shower head vibrator. 3,924,808, Cl. 239-102.000.

Cooper, Donald Walter; and Unruh, James Bradley, to International Business Machines Corporation. Centering of textual character fields about a point. 3,924,723, Cl. 197-19.000.

Cooper, Earl A.; and Stephenson, Roger C., to G & H Technology, Inc. Fire fighting system. 3,924,688, Cl. 169-61.000.

Cooper, Frederick, to Lawrence Peska Associates, Inc., a part interest. Garbage can enclosure device. 3,924,913, Cl. 312-258.000.

Cooper, Glen D.; and Abolins, Visvaldis, to General Electric Company. Light stabilized polyphenylene ether resin composition. 3,925,509, Cl. 260-876.00R.

Cooper, Robin D. G.; and Herron, David K., to Eli Lilly and Company. Acylureido substituted cephalosporins. 3,925,368, Cl. 260-240.00J.

Copal Company Limited: *See—*
Nakatani, Atsutada, 3,925,799.
Satake, Yoshihiro, 3,925,771.

Coquard, Michel Alain: *See—*
Cheysson, Philippe Jean-Marie; Verney, Paul Jean; and Coquard, Michel Alain, 3,925,204.

Cordis Corporation: *See—*
Hess, Stanley R., 3,924,639.

Corey, Garland G.; and Weinstein, Bernard, to American Home Products Corporation. Novel laundering compositions. 3,925,227, Cl. 252-106.000.

Cornell, Charles R.; Simpson, Dennis D.; and Knapp, Kenneth K., to Eaton Corporation. Hydrostatic transmission control system. 3,924,410, Cl. 60-403.000.

Corning Glass Works: *See—*
Piasio, Roger N.; and Woiszwillo, James E., 3,925,355.

Corte, Herbert; Heller, Harold; and Netz, Otto, to Bayer Aktiengesellschaft. Process for the production of anion exchangers. 3,925,264, Cl. 260-2.10E.

Cory Food Services, Inc.: *See—*
Vitous, Charles J., 3,924,525.

Cory, Halsey W., to Force Control Industries, Inc. Clutch-brake unit. 3,924,715, Cl. 192-18.00A.

Costas, Louis P., to Anaconda American Brass Company. Method of monitoring the active roughening agent in a copper plating bath. 3,925,168, Cl. 204-1.00T.

Costerousse, Germain: *See—*
Heurtaux, Simone; and Costerousse, Germain, 3,925,393.

Coulter Electronics, Inc.: *See—*
Hogg, Walter R., 3,924,947.

Coupek, Jiri; and Gut, Vladimir, to Ceskoslovenska akademie ved. Polymeric carrier for a controlled synthesis of peptides. 3,925,267, Cl. 260-2.50R.

Coussot, Gerard; and Dieulesaint, Eugene, to Thomson-CSF. Method of manufacturing an electromechanical system having a high resonance frequency. 3,924,312, Cl. 29-25.350.

Couture, Paul A.: *See—*
Anghinetti, Joseph R.; Couture, Paul A.; and Jentoft, Arthur P., 3,924,372.

Coville, William W.: *See—*
Hubbard, David W.; and Coville, William W., 3,924,532.

Covington, Dennis: *See—*
Beacham, Ronald; Covington, Dennis; and McNutt, Reginald, 3,925,770.

Cox, Charles D.; Johnson, Craig E.; and Henderson, Larry D., to United States of America, Navy. Moisture replacement in pelletized nitrocellulose. 3,925,125, Cl. 149-96.000.

Cox, Ralph, to Phillips Petroleum Company. Method for activating a catalyst. 3,925,258, Cl. 252-467.000.

CPT Corporation: *See—*
Wienhold, James L., 3,924,722.

Creene, Noel: *See—*
Brunie, Jean-Claude; Creene, Noel; and Maurel, Felix, 3,925,316.

Creighton University: *See—*
Sanders, W. Eugene, Jr.; and Sanders, Christine C., 3,925,160.

Crews, Roy E.: *See—*
Berman, Paul A.; Giras, Theodore C.; and Crews, Roy E., 3,925,679.

Cricchi, James Ronald; and Ruehling, Barry W., to Westinghouse Electric Corporation. Structure of and the method of processing a semiconductor matrix or MNOS memory elements. 3,925,804, Cl. 357-23.000.

Crinospital S.p.A.: *See—*
Ferro, Antonio, 3,924,617.

Crites, Lila J.: *See—*
Cohen, Robert S.; and Crites, Lila J., 3,925,489.

Cromeens, Jeff Y., to Industrial Woodworking Machine Co. Inc. Pressure head assembly. 3,924,668, Cl. 144-244.000.

Crooks, Russell W.; and Maya, Gregory, to Electromould Engineering Limited. Apparatus for molding articles. 3,924,995, Cl. 425-243.000.

Crosby, John; Paton, Robert Michael; and Rennie, Robert Allan Campbell, to Imperial Chemical Industries Limited. Production of isocyanates. 3,925,435, Cl. 260-453.00P.

Cross, Barrington, to American Cyanamid Company. Pyrazolinium compounds as herbicides. 3,925,408, Cl. 260-311.000.

Crouch, Stephen John, to Rover Company Limited, The. Rear wheel suspension for a vehicle having a beam axle. 3,924,873, Cl. 280-124.00R.

Crownshaw, Robert; and Jubb, Ronald, to British Steel Corporation. Machine for processing billet or bar stock. 3,924,358, Cl. 51-34.00C.

Cruchant, Serge Alfred: *See—*
Collard, Maurice A.; Cruchant, Serge Alfred; and Lafon, Jean-Louis, 3,924,830.

Cuhel, Gerald A.: *See—*
Wamsley, Vernon R.; and Cuhel, Gerald A., 3,924,349.

Cummins, Donald, to AMF Incorporated. Belt loop feeding apparatus. 3,924,549, Cl. 112-104.000.

Cummins, Donald, to AMF Incorporated. Thread chain cutting apparatus. 3,924,554, Cl. 112-252.000.

Cummins, Richard D., to Carleton Controls Corporation. Atmospheric pressure rate of change indicator. 3,924,464, Cl. 73-170.00R.

Cunningham, Robert D.: *See—*
Woodworth, William H.; and Cunningham, Robert D., 3,924,458.

Curtiss-Wright Corporation: *See—*
Jones, Charles, 3,924,581.
Loyd, Robert William, Jr.; and Wallace, Raymond P., 3,924,978.

Cuthbertson, Edmond N.; and Davenport, Raymond, to Sandoz, Inc. Oil-in-water transfer printing emulsions and method. 3,925,273, Cl. 260-17.00A.

CVI Corporation: *See—*
Hickey, Thomas Nelson; and Spulgis, Ivars Sigurds, 3,925,046.

Czernik, Daniel E.; and McDowell, Donald J., to Felt Products Mfg. Co. Bearing pad and bridge construction. 3,924,907, Cl. 308-3.00R.

D.A. Pitman Limited: *See—*
Robertson, Malcolm Eric Alexander; Marshall, John; Brabants, Jules Anthony Peter; and Davies, Michael Edward, 3,925,665.

Dabrowka, Stanislav Pawel, to Lucas Aerospace Limited. Lubricating and draining device. 3,924,708, Cl. 184-105.00R.

Daftary, Rasik D., to Archer Daniels Midland Company. Wet process for making blander high-protein soybean products. 3,925,569, Cl. 426-634.000.

Dahl, Klaus Joachim; and Kameda, Floyd Masato, to Raychem Corporation. Antioxidants for polyarylether ketones. 3,925,307, Cl. 260-45.75R.

Dahl, Rolf, to Continental Tapes, Incorporated. Polyurethane pressure-sensitive adhesive products and processes. 3,925,283, Cl. 260-24.000.

Dahlbom, Johan Richard; Karlen, Bo Lennart; and Lindgren, Sune Gunnar, to Aktiebolaget Astra. Oxotremorine antagonist. 3,925,411, Cl. 260-326.250.

Dahm, Johann; Borck, Joachim; Nowak, Herbert; Zimane, Zdenek; and Kayser, Detlev, to Merck Patent Gesellschaft mit beschrankter Haftung. Phenoxyacetic acid derivatives. 3,925,394, Cl. 260-293.830.

Daido Seiko Kabushiki Kaisha: *See—*
Kato, Tetsuo; and Sekio, Isao, 3,925,063.

Daiichi Rubber Co., Ltd.: *See—*
Hamamura, Yoshitaro, 3,924,305.

Daiichi Seiyaku Company Limited: *See—*
Suzuki, Nagayuki; Nakamura, Tsutomu; and Yamada, Katsuto, 3,925,584.

Daikin Kogyo Co., Ltd.: *See—*
Ukaji, Rokuo; Kamihigoshi, Tutomu; Mikami, Kenji; and Takaki, Shoji, 3,925,263.
Ukaji, Rokuo; Kamihigoshi, Tutomu; Mikami, Kenji; and Takaki, Shoji, 3,925,492.

Daimler-Benz Aktiengesellschaft: *See—*
Andres, Rudolf; Moller, Hermann; and Seyfried, Franz, 3,925,656.
Barenyi, Bela; and Renner, Hermann, 3,924,874.
Geier, Bernd, 3,924,892.
Hoffmann, Friedrich; and von Kamp, Wilhelm, 3,924,711.
Renner, Hermann; and Barenyi, Bela, 3,924,707.

Dainippon Screen Seizo Kabushiki-Kaisha: *See—*
Doi, Yasushi; Shoda, Mikio; Oguri, Masatoshi; and Hashimoto, Joji, 3,925,602.

Daktronics, Inc.: *See—*
Sander, Duane E., 3,924,470.

Dana Corporation: *See—*
Bergishagen, Finn; and Schmidt, James J., 3,924,455.

D'Angelo, Joseph; Maccherone, Lawrence; and Maros, Frank George, to Du Pont de Nemours, E. I., and Company. Method of dispensing a microfoam sheet. 3,924,497, Cl. 83-16.000.

Darcy, John J.: *See—*
Cohen, William D.; and Darcy, John J., 3,924,823.

Dardoufas, Kimon Constantine: *See—*
Marshall, Robert Moore; and Dardoufas, Kimon Constantine, 3,925,588.

Dart Industries Inc.: *See—*
Arrandale, Roy S.; and Campagna, Edward R., 3,924,767.

Dautzenberg, Frits M.: *See—*
Van Klinken, Jakob; and Dautzenberg, Frits M., 3,925,197.

Davenport, Raymond: *See—*
Cuthbertson, Edmond N.; and Davenport, Raymond, 3,925,273.

Davidson, Jimmy L.: *See—*
Cook, Koy B., Jr.; Davidson, Jimmy L.; Gibson, Joseph D.; and Patterson, Raymond B., III, 3,924,321.

Davies, Michael Edward: *See—*
Robertson, Malcolm Eric Alexander; Marshall, John; Brabants, Jules Anthony Peter; and Davies, Michael Edward, 3,925,665.

Davis, Charles H. Emergency sign device. 3,924,344, Cl. 40-129.00C.

Davis, Charles W., to Texaco Inc. Internal combustion engine. 3,924,598, Cl. 123-32.0ST.

Davis, Irwin; Skoultchi, Martin M.; and Fries, John A., to National Starch and Chemical Corporation. Pressure sensitive hot melt adhesives. 3,925,282, Cl. 260-23.00H.

Davis, Robert Leon: *See—*
Cardwell, Robert Edward; Davis, Robert Leon; Marino, Patrick John; and McNamara, Edward Joseph, 3,925,600.
Cardwell, Robert Edward; Carlson, David Emory; Davis, Robert Leon; McNamara, Edward Joseph; Pilc, Randolph John; Schlanger, Gabriel Gary; Tutelman, David Morris; Warwick, Peter Stephen; and Zydney, Herbert Mortimer, 3,925,601.

Dawson, Peter H., to Canadian Patents and Development Limited. High-resolution focussing dipole mass spectrometer. 3,925,662, Cl. 250-290.000.

Dayco Corporation: *See—*
Meadows, Roger D., 3,924,482.

De Rotterdamsche Droogdok Maatschappij B.V.: *See—*
Mulder, Jan Pieter Fokke, 3,925,634.

Dea, Stanley J. System for home wastewater treatment and disposal. 3,925,206, Cl. 210-104.000.

Dean, William Bruce, to Johnson & Johnson. Drapery fabrics. 3,924,663, Cl. 139-420.00R.

DeBaryshe, Paul Gregory: *See—*
Munroe, James L.; and DeBaryshe, Paul Gregory, 3,924,937.

Debus, Henri R.: *See—*
Draguez de Hault, Emmanuel R. E. G.; Debus, Henri R.; and Van Tongelen, Marcel, 3,925,425.

DeCaro, Charles J., to Textron, Inc. Composite drill screw. 3,924,508, Cl. 85-41.000.

DeCenzo, Herbert A. Constrictor biased electrical pin and socket type connector. 3,924,922, Cl. 339-259.00R.

Dechambre, Jean Theophile Fortunat; Lousberg, Pierre Jean Simon; and Pirard, Joseph Jean Julien. Machine for cutting cards from continuous strips employed in multi-copying. 3,924,499, Cl. 83-96.000.

Decker, Gerd, to Volkswagenwerk Aktiengesellschaft. Internal combustion engine operated by a layered charge. 3,924,584, Cl. 123-32.0ST.

Decker, Herbert, to Triumph Werke Nurnberg A.G. Typehead support for a single element printer. 3,924,726, Cl. 197-55.000.

Decret, Jean-Claude; Denis, Pierre; and Jourdan, Paul, to Commissariat a l'Energie Atomique; and Institut National de la Recherche Agronomique. Heliograph. 3,924,954, Cl. 356-188.000.

Deere & Company: *See—*
Cheatum, Leo George, 3,924,391.
Hanser, Paul Edmund; and Snyder, William Lee, 3,924,656.
Nelson, Roger John, 3,924,516.
Wagner, Joseph Francis; Broderick, Ross Thomas; Link, Joseph Edward; and Stover, David Emmert, 3,924,904.
Whisler, Edwin Lee, 3,924,524.
Williams, Lary Lynn, 3,924,891.

Deering Milliken Research Corporation: *See—*
Ingham, Robert M., Jr., 3,924,297.
Richards, Ernest Levon, 3,924,289.

de Habsburg, Dominic, to Samos. Easy-opening packaging for melted or semi-liquid substances. 3,924,803, Cl. 229-87.00F.

Dehm, Darrell L.: *See—*
Coleman, William R., 3,925,636.

Dehne, Wilfried E.; and Mang, Josef, to Emerson Electric Co. Overload clutch. 3,924,421, Cl. 64-29.000.

Dekan, Howard L.; and Ryan, John W. Non-rolling game ball. 3,924,856, Cl. 273-106.00R.

DeLong, Carol. Method and apparatus for preserving solvent-dispersed chemicals. 3,924,733, Cl. 206-1.700.

Del Priore, Paul Joseph: *See—*
White, Joseph Paul; and Del Priore, Paul Joseph, 3,924,361.

Deltrol Corporation: *See—*
Harris, John L., 3,925,630.

Demange, Philippe: *See—*
Bono, Pierre; Demange, Philippe; Leclere, Claudine; and Tissier, Alexis, 3,925,099.

De Marinis, Robert M.; and Hoover, John R. E., to SmithKline Corporation. Substituted sulfonylacetamido cephalosporins. 3,925,373, Cl. 260-243.00C.

Dempster, Philip T.; and Pun, John Y. Spirometer apparatus and method. 3,924,612, Cl. 128-2.080.

Denis, Pierre: *See—*
Decret, Jean-Claude; Denis, Pierre; and Jourdan, Paul, 3,924,954.

Dennie, Richard H., to Xerox Corporation. Reproduction machine with means for solidifying the reclaim toner. 3,924,566, Cl. 118-637.000.

Dennis, Clement O., Sr.: *See—*
Everhardt, William F.; Brown, Henry L., Jr.; and Dennis, Clement O., Sr., 3,925,005.

Dennis, Thomas Mann, to Bell Telephone Laboratories, Incorporated. Combined scrambler-encoder for multilevel digital data. 3,925,611, Cl. 178-22.000.

Dennison Manufacturing Company: *See—*
Merser, Francis Gerard, 3,924,298.

Denson, Donald Derby: *See—*
Story, Paul Richard; Busch, Peter; Denson, Donald Derby; and Wright, Carl Edward, 3,925,421.

Denzel, Theodor: *See—*
Hoehn, Hans; and Denzel, Theodor, 3,925,388.

Deriga, Nikolai Filippovich: *See—*
Mogilevsky, Vitaly Moritsovich; Deriga, Nikolai Filippovich; Ekimov, Vadim Petrovich; Erastov, Alexandr Petrovich; Posokhin, Viktor Vladimirovich; and Furer, Benya Elievich, 3,925,725.

DerMarderosian, Dikrun; and Tremblay, Paul Albert, to W. R. Grace & Co. Apparatus for producing grooves in foamed thermoplastic insulation boards. 3,924,495, Cl. 83-5.000.

DerMarderosian, Dikrun; and Tremblay, Paul Albert, to W. R. Grace & Co. Method for producing grooves in formed thermoplastic insulation boards. 3,924,496, Cl. 83-5.000.

de Rosa, Louis A., to International Telephone and Telegraph Corporation. Secure communication system. 3,925,730, Cl. 325-32.000.

Desmond, John D.; and Hart, Joseph J., to Container Corporation of America. Pilfer resistant package. 3,924,800, Cl. 229-39.00R.

DeSoto, Inc.: *See—*
Gaske, Joseph E., 3,925,349.

Deumens, Johannes J. M.: *See—*
Schaafsma, Sijbrandus E.; and Deumens, Johannes J. M., 3,925,422.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Engel, Claus Richard; Linke, Heinz; Rothbuhr, Lothar; Sroka, Werner; Vogt, Jes; and Westlinning, Hermann, 3,925,301.
Geiger, Friedhelm; Heimberger, Werner; Schreyer, Gerd; and Weigert, Wolfgang, 3,925,377.

Devendorf, Don C.: *See—*
Gaskill, James R., Jr.; and Devendorf, Don C., 3,925,684.
Gaskill, James R., Jr.; and Devendorf, Don C., 3,925,691.

Dewhirst, Donald R.; and Muir, Alexander R., to Hughes Aircraft Company. Optical partial wave plate and method of fabricating and using same. 3,924,930, Cl. 350-157.000.

Diacont, George P., Jr.; and Serio, Vincent J., Jr., to AMF Incorporated. Hem forming apparatus. 3,924,785, Cl. 223-2.000.

Diakov, Nikola Ganev: *See—*
Popov, Encho Nikolov; Diakov, Nikola Ganev; Dobreva-Dimitrova, Emilia; Apostolov, Roumen Konstantinov; and Hristov, Hristo Petkov, 3,925,696.

Diamond Seven, Inc.: *See—*
Carapellucci, Joseph, 3,924,480.

Dick, John O.; and Forrester, Howard M, to United States of America, Navy. Fuze signal circuit. 3,924,536, Cl. 102-70.20P.

Dierks & Soehne: *See—*
Hohnfeld, Peter; and Langenberg, Hartmut, 3,924,835.

Diesel Kiki Co., Ltd.: *See—*
Aoki, Hachiro, 3,924,594.

Dieulesaint, Eugene: *See—*
Coussot, Gerard; and Dieulesaint, Eugene, 3,924,312.

Di Gaetano, Dante. Nut shell cutter. 3,924,326, Cl. 30-120.200.

Di Grazia, Alfred. Truck door position indicator. 3,924,558, Cl. 116-28.00R.

Dinges, Karl: *See—*
Schuster, Herbert; Huther, Edmund; Ott, Karl-Heinz; and Dinges, Karl, 3,925,513.

DiRubio, Robert L.: *See—*
Adams, Herbert H. F.; Anderson, Jon C.; Blair, Murray R., Jr.; DiRubio, Robert L.; and Takman, Bertil H., 3,925,469.

Dittrich, Siegfried; and Jackel, Kurt. Board game apparatus. 3,924,858, Cl. 273-134.0AC.

Dittrich, Wolfgang M. Apparatus for illuminating small particles that are being counted and characterized. 3,924,951, Cl. 356-102.000.

Dixon, Kenneth C.: *See—*
Anna, Leo A.; and Dixon, Kenneth C., 3,925,034.

Dixon, William A. Method and system for regulating peak residential power demand. 3,925,680, Cl. 307-39.000.

Dobreva-Dimitrova, Emilia: *See—*
Popov, Encho Nikolov; Diakov, Nikola Ganev; Dobreva-Dimitrova, Emilia; Apostolov, Roumen Konstantinov; and Hristov, Hristo Petkov, 3,925,696.

Dobrosielski, Stephen S.: *See—*
Frank, Stanley L.; and Dobrosielski, Stephen S., 3,925,632.

Doi, Yasushi; Shoda, Mikio; Oguri, Masatoshi; and Hashimoto, Joji, to Dainippon Screen Seizo Kabushiki-Kaisha. Apparatus for engraving a portrait on certification card. 3,925,602, Cl. 178-6.60B.

Donnelly, John H. Closure for containers. 3,924,774, Cl. 220-93.000.

Donohue, John, to Colgate-Palmolive Company. Antibacterial oral compositions containing preservative-antioxidants. 3,925,543, Cl. 424-52.000.

Donovan, Betty J. Sleep-walker bag. 3,924,273, Cl. 2-69.500.

Dorigotti, Luciano: *See—*
Carpi, Carlo; Dorigotti, Luciano; and Pifferi, Giorgio, 3,925,381.

Dorlars, Alfons; and Schellhammer, Carl-Wolfgang, to Bayer Aktiengesellschaft. Triazoyl-naphthalimide brightening agents. 3,925,390, Cl. 260-281.0NH.

Dover Chemical Corporation: *See—*
Cohen, Robert S.; and Crites, Lila J., 3,925,489.

Dow Chemical Company, The: *See—*
Goralski, Christian T.; and Klingler, Thomas C., 3,925,468.
Hamish, Small; and Stevens, Timothy S., 3,925,019.
Schrenk, Walter J., 3,924,990.

Doyle, Alfred Michael; and Shear, William, to Du Pont de Nemours, E. I., and Company. Controlling viscosity of chloroprene-sulfur copolymers. 3,925,294, Cl. 260-29.7SQ.

Drabek, Jozef: *See—*
Pissiotas, Georg; Meyer, Willy; Bohner, Beat; and Drabek, Jozef, 3,925,517.

Draguez de Hault, Emmanuel R. E. G.; Debus, Henri R.; and Van Tongelen, Marcel, to Labofina S.A. Process for producing anhydrides of aromatic polycarboxylic acids. 3,925,425, Cl. 260-346.400.

Dresser Industries, Inc.: *See—*
Martin, Paul Warren, 3,924,433.

Drnevich, Vincent P. Resonant column testing apparatus. 3,924,451, Cl. 73-67.200.

Droegemueller, William; Eberhardt, Ralph N., Jr.; and Bingham, Paul E. Cyrogenic bladder for necrosing tissue cells. 3,924,628, Cl. 128-303.100.

D'Silva, Arthur P.; and Fassel, Velmer A., to United States of America, Energy Research and Development Administration. X-ray image intensifier phosphor. 3,925,674, Cl. 250-483.000.

DSO "Elprom": *See—*
Popov, Encho Nikolov; Diakov, Nikola Ganev; Dobreva-Dimitrova, Emilia; Apostolov, Roumen Konstantinov; and Hristov, Hristo Petkov, 3,925,696.

Du Chambon, Michel G. J., to B. V. Peximac. Incinerator. 3,924,548, Cl. 110-8.00C.

Duggan, Matthew, to Rolls-Royce (1971) Limited. Closed loop control system having plural modes of operation. 3,925,640, Cl. 235-150.100.

Duguay, Michel Albert, to Bell Telephone Laboratories, Incorporated. Optical sampling oscilloscope utilizing organ arrays of optical fibers. 3,925,727, Cl. 324-121.00R.

Dunbar, F. Curtiss: *See—*
Flinchum, Charles; Dunbar, F. Curtiss; and Arnold, Jerry L., 3,925,579.

Dunchock, Richard S., to Optarac Corporation. Eyeglass display unit. 3,924,750, Cl. 211-13.000.

Duo-Fast Corporation: *See—*
Avery, Hazelton H.; and Morabito, Salvatore, 3,924,789.

Du Pont de Nemours, E. I., and Company: *See—*
Adams, John Benjamin, Jr.; and Schwing, Gregory Wayne, 3,925,380.
Baker, Melvin C., 3,925,484.
Bither, Tom Allen, Jr., 3,925,537.
D'Angelo, Joseph; Maccherone, Lawrence; and Maros, Frank George, 3,924,497.
Doyle, Alfred Michael; and Shear, William, 3,925,294.
Friend, Lindsay Carlton, 3,924,918.
Garth, Bruce Hollis, 3,925,030.
Grot, Walther Gustav, 3,925,135.
Hodge, James Dwight, 3,924,988.
Holmes, David Alan, 3,925,292.
Josey, Alden Dwayne; and Kirchner, Jack Robert, 3,925,497.
Khan, Ausat Ali, 3,925,340.
King, Charles Morgan; Seidel, William Carl; and Tolman, Chadwick Alma, 3,925,445.
Logothetis, Anestis Leonidas, 3,925,326.
Mc Shane, Herbert Felix, Jr., 3,925,334.
Phillips, Thomas Richard, 3,925,299.
Shor, Arthur Charles; and Van Dyk, John William, 3,925,574.
Turnbull, John William, 3,925,323.
Woodruff, Benjamin T., 3,925,233.

Duprez, Wayne R., to Standard-Thomson Corporation. Hose clamp comprising a one-piece band and housing. 3,924,308, Cl. 24-274.00R.

Duquette, Richard W. Photographic lens safety ring. 3,924,786, Cl. 224-5.00V.

Duranleau, Roger G.; and Larkin, John M., to Texaco Inc. Preparation of alkylamides. 3,925,430, Cl. 260-404.000.

Duranleau, Roger G.; and Matteo, John F., to Texaco Inc. Thermal preparation of alkylamides. 3,925,431, Cl. 260-404.000.

Durdin, Peter Robert, to AMF Incorporated. Refrigerator control apparatus. 3,924,416, Cl. 62-80.000.

Dynamit Nobel AG: *See—*
Bruning, Klaus; and Lob, Heinrich, 3,924,836.

Dynamit Nobel Aktiengesellschaft: *See—*
Berthmann, Adolf; Martin, Gerhard; and Klunsch, Maximilian, 3,925,122.
Strunk, Manfred; Kroschel, Heinz; and Voss, Alfred, 3,924,510.

E. R. Squibb & Sons, Inc.: *See—*
Hoehn, Hans; and Denzel, Theodor, 3,925,388.
Krapcho, John; and Turk, Chester Frank, 3,925,384.

E. T. Wright & Co., Inc.: *See—*
Bernier, Louis E.; and Giblin, James P., 3,925,529.

E-Z Machine Corporation: *See—*
Lowe, William F.; and Bondy, Harry L., 3,925,144.

Eagle-Motive Industries, Inc.: *See—*
Woods, Robert L., 3,924,585.

Earle, Harold Westly; and Robbins, Joseph, to Bell Telephone Laboratories, Incorporated. Coupling circuit for providing bilateral protection from hazardous voltages. 3,925,624, Cl. 179-81.00R.

Eastman Kodak Company: *See—*
Beach, David E., 3,925,792.
Ettischer, Helmut, 3,925,797.

Eaton Corporation: *See—*
Cornell, Charles R.; Simpson, Dennis D.; and Knapp, Kenneth K., 3,924,410.
Richards, Elmer A., 3,924,484.

Eaton, Richard E. Surgically implantable trapezium prosthesis and method of reconstructing the thumb carpometacarpal joint. 3,924,276, Cl. 3-1.910.

Ebauches S.A.: *See—*
Meister, Rene; and Tyrode, Alain, 3,925,693.

Ebbing, Johannes: *See—*
Belliot, Christian; Cheylan, Etienne; Madelaine, Serge; and Ebbing, Johannes, 3,925,535.

Ebeling, Harold O., to Black, Sivalls & Bryson, Inc. Fluid heater apparatus. 3,924,574, Cl. 122-23.000.

Eberhard, Heinz; and Menzer, Anton, to Springfield Instrument Company, Inc. Barometer capsule. 3,924,518, Cl. 92-34.000.

Eberhardt, Ralph N., Jr.: *See—*
Droegemueller, William; Eberhardt, Ralph N., Jr.; and Bingham, Paul E., 3,924,628.

Eberle, Wolfgang: *See—*
Breitenfellner, Franz; and Eberle, Wolfgang, 3,925,591.

Eberspaecher, Otto; and Pfisterer, Herman, to Siemens Aktiengesellschaft. Absorption layer for use during x-ray fluorescence analysis which prevents hard x-rays. 3,925,678, Cl. 250-508.000.

Ebert, Robert H., to United States of America, Navy. General purpose electronic interface equipment package. 3,925,710, Cl. 317-100.000.

Eckhoff, David W.; and Fullmer, Blaine L., to University of Utah. Apparatus and method of air classifying municipal solid wastes. 3,925,198, Cl. 209-3.000.

Economics Laboratory, Inc.: *See—*
Lechner, Thomas G.; and Besse, Michael E., 3,925,087.

ECRM, Inc.: *See—*
Mason, Samuel J.; Troxel, Donald E.; and Schreiber, William F., 3,925,760.

Edelsohn, Henry, to International Telephone and Telegraph Corporation. Doppler microwave landing system signal simulator. 3,924,341, Cl. 35-10.400.

Edler, Bruno. Process for retreading a vehicle tyre. 3,925,128, Cl. 156-96.000.

Edstrom, Nils Herbert; Lindqvist, Stig Gustaf Wilhelm; and Sparrendahl, Gunnar Erik William, to Telefonaktiebolaget L M Ericsson. Method of transfer of switching order information for transmission of PCM words. 3,925,620, Cl. 179-15.0AT.

Edwards, Jerry Clyde. Powered windshield track cutter. 3,924,327, Cl. 30-277.000.

Edwards, Joseph. Vehicle fuel loss alarm. 3,925,756, Cl. 340-59.000.

Eerkens, Cornelis. Wind-inflatable tent. 3,924,364, Cl. 52-2.000.

Ehlenz, Peter: *See—*
Moroni, Rolf; Rinck, Friedrich Karl; and Ehlenz, Peter, 3,925,248.

Eicher, Theo; Muller, Friedemann; and Krebs, Klaus-Werner, to Haarmann & Reimer GmbH. Tobacco and tobacco substitute material including metal chelate compounds. 3,924,642, Cl. 131-2.000.

Eiki Industrial Co., Ltd.: *See—*
Minakawa, Yoshinari; and Sashida, Akinobu, 3,924,821.

Eilingsfeld, Heinz: *See—*
Elser, Wolfgang; Eilingsfeld, Heinz; and Schoch, Werner, 3,925,427.

Eisenlohr, Gerald Mason, to AMF Incorporated. Feed mechanism for pneumatic conveyor systems. 3,924,900, Cl. 302-49.000.

Ekimov, Vadim Petrovich: *See—*
Mogilevsky, Vitaly Moritsovich; Deriga, Nikolai Filippovich; Ekimov, Vadim Petrovich; Erastov, Alexandr Petrovich; Posokhin, Viktor Vladimirovich; and Furer, Benya Elievich, 3,925,725.

Ekman, Lars Gustaf, to Olle Blomqvist Rehab-Produkter AB. Bathtub. 3,924,278, Cl. 4-176.000.

Elco Corporation: *See*—
Munshower, Kenneth, 3,924,917.
Elder Wilbert Corporation: *See*—
Andrus, Edward R., Jr.; Fahnstrom, Dale E.; Hansen, James G.; and Nichols, Charles E., 3,924,309.
Electric Power Research Institute: *See*—
Saunders, Richard C.; and Heredy, Laszlo A., 3,925,098.
Electroacustic GmbH Kiel: *See*—
Kuhn, Hans-Robert, 3,925,628.
Electromould Engineering Limited: *See*—
Crooks, Russell W.; and Maya, Gregory, 3,924,995.
Electronor Corporation: *See*—
Lint, Joseph J., 3,925,185.
Elektro-Physik, Hans Nix & Dr. Ing. E. Steingroever, KG: *See*—
Steingroever, Erich, 3,925,724.
Eli Lilly and Company: *See*—
Chauvette, Robert R., 3,925,372.
Cooper, Robin D. G.; and Herron, David K., 3,925,368.
Elias, Jiri: *See*—
Esser, Miroslav; Ledr, Zdenek; Ferkl, Frantisek; Kubovy, Miloslav; Ripka, Josef; Hortlik, Frantisek; and Elias, Jiri, 3,924,398.
Elkem-Spigerverket A/S: *See*—
Onarheim, Einar, 3,925,058.
Elliott, Anthony, to Judge International Limited. Line gripping pegs. 3,924,303, Cl. 24-137.00R.
Ellis, Christopher Robinson: *See*—
Stirling, Walter Robert; Ellis, Christopher Robinson; and Silvester, Brian Carol, 3,924,712.
Ellis, Daniel A., to Mueller Co. Stab-type coupling joint. 3,924,882, Cl. 285-175.000.
Ellis, Daniel A.: *See*—
Leopold, Wilbur R., Jr.; Hackman, Frank C.; Luckenbill, Lawrence F.; and Ellis, Daniel A., 3,924,877.
Elms, Robert T.; and Keck, Merle E., to Westinghouse Electric Corporation. Low-cost power-reducing device for hid lamp. 3,925,705, Cl. 315-246.000.
Elofson, Gary L.: *See*—
Straughn, Robert O.; Elofson, Gary L.; and Reinhart, Richard D., 3,925,563.
Elphiac S.A.: *See*—
Poncin, Roger, 3,924,439.
Elser, Wolfgang; Eilingsfeld, Heinz; and Schoch, Werner, to BASF Aktiengesellschaft. Manufacture of anthraquinonoid disperse dyes containing bromine. 3,925,427, Cl. 260-380.000.
Elsworth, Robert M., to General Electric Company. Pressure hopper. 3,924,780, Cl. 222-64.000.
Ely, Christopher Scott, to Albright & Wilson Ltd. Polymeric sealants. 3,925,331, Cl. 260-79.000.
Emde, Friedhelm: *See*—
Reinke, Friedhelm; Stengel, Edgar; and Emde, Friedhelm, 3,925,570.
Emergency Products Corporation: *See*—
Green, Robert Leonard, 3,925,773.
Emerson Electric Co.: *See*—
Dehne, Wilfried E.; and Mang, Josef, 3,924,421.
Hulett, James S.; and Shestag, Lowell N., 3,925,781.
Emerson, Lucian F., to GTE Sylvania Incorporated. Dual slope ramp circuit for anti-skid control circuitry. 3,924,903, Cl. 303-21.0BE.
Emery Industries, Inc.: *See*—
Sturwold, Robert J.; and Barrett, Fred O., 3,925,589.
Emile Fortier Inc.: *See*—
Fortier, Germain, 3,924,956.
Emoto, Kiyotada: *See*—
Ogura, Eiji; Nomura, Nobuki; and Emoto, Kiyotada, 3,925,247.
Enders, Edgar: *See*—
Buchel, Karl Heinz; Frohberger, Paul-Ernst; Scheinpflug, Hans; and Enders, Edgar, 3,925,551.
Enei, Hitoshi; Matsui, Hiroshi; and Hirose, Yoshio, to Ajinomoto Co., Inc. Method of producing inosine-5′-monophosphate. 3,925,154, Cl. 195-28.00N.
Eneim, Arthur A.: *See*—
Buller, Joseph S.; Eneim, Arthur A.; and Hitzelberger, David A., 3,924,654.
Energetics Science, Inc.: *See*—
Oswin, Harry G.; and Blurton, Keith F., 3,925,183.
Eng, Jeffrey D.; and Harke, Cyril J., to Hooker Chemicals & Plastics Corporation. Electrolytic method for the manufacture of hypochlorites. 3,925,174, Cl. 204-95.000.
Engel, Claus Richard; Linke, Heinz; Rothbuhr, Lothar; Sroka, Werner; Vogt, Jes; and Westlinning, Hermann, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the continuous production of carbon black-synthetic resin concentrates. 3,925,301, Cl. 260-42.000.
Engel, Niels N. Superhard martensite and method of making the same. 3,925,116, Cl. 148-143.000.
Engelhard Minerals & Chemicals Corporation: *See*—
Horzepa, John P.; and Swanson, David B., 3,925,257.
England, John S., to B. F. Goodrich Company, The. Actuator. 3,924,519, Cl. 92-92.000.
Engle, Thomas, to General Signal Corporation. Braking system for a light rail vehicle. 3,924,902, Cl. 303-21.00A.
English Electric Valve Company Limited: *See*—
Banks, Peter Baldwin; and Scholz, Hans, 3,925,699.
Ennenbach, Karl-Heinz: *See*—
Hausweiler, Arnold; Paris, Nikolaus; and Ennenbach, Karl-Heinz, 3,925,250.
Environment/One Corporation: *See*—
Matrone, John L.; and Lyons, William E., 3,925,043.
Epperson, Victor R. Pan, tilt and roll tripod head. 3,924,828, Cl. 248-179.000.
Erastov, Alexandr Petrovich: *See*—
Mogilevsky, Vitaly Moritsovich; Deriga, Nikolai Filippovich; Ekimov, Vadim Petrovich; Erastov, Alexandr Petrovich; Posokhin, Viktor Vladimirovich; and Furer, Benya Elievich, 3,925,725.
Erb, Darrell M., to Hughes Aircraft Company. System for transferring charge between spaced apart CCDs by direct series connection. 3,925,805, Cl. 357-24.000.
Erdolchemie Gesellschaft mit beschrankter Haftung: *See*—
Hausweiler, Arnold; Paris, Nikolaus; and Ennenbach, Karl-Heinz, 3,925,250.
Erickson, Norman. Dental appliance. 3,924,333, Cl. 32-33.000.
Ericson, John W.: *See*—
Wilson, Stewart W.; and Ericson, John W., 3,924,339.
Ernst, Otto; Meyerhans, Konrad; and Kusenberg, Eugen, to Ciba-Geigy Corporation. Storage-stable multi-component thermosetting resin system. 3,924,737, Cl. 206-84.000.
Ersfeld, Heinz: *See*—
Althausen, Ferdinand; Boden, Heinrich; Ersfeld, Heinz; Klier, Lothar; Raffel, Reiner; and Schneider, Walter, 3,924,989.
Erwin, Ransome W., to Austral-Erwin Engineering Co. Heat exchangers & evaporators. 3,925,148, Cl. 159-23.000.
Erwin, Ransome W., to Austral-Erwin Engineering Co. Heat exchangers & evaporators. 3,925,149, Cl. 159-47.000.
Esashi, Hanjiro; and Yoshizaki, Shuji, to Sony Corporation. Endless loop tape cartridge for use with tape extraction systems. 3,925,820, Cl. 360-132.000.
Esco Manufacturing Company: *See*—
McClain, James E., 3,924,919.
Esquenet, Bernard Etienne: *See*—
Livingston, Howard J.; and Esquenet, Bernard Etienne, 3,925,214.
Essebaggers, Jan, to United States of America, Energy Research and Development Administration. Energy absorber for sodium-heated heat exchanger. 3,924,675, Cl. 165-134.000.
Esser, Karl; and Segain, John E., to International Standard Electric Corporation. Method of making a selenium charge carrier plate. 3,925,571, Cl. 427-76.000.
Esser, Miroslav; Ledr, Zdenek; Ferkl, Frantisek; Kubovy, Miloslav; Ripka, Josef; Hortlik, Frantisek; and Elias, Jiri, to Vyzkumny ustav bavlnarsky. Method of and apparatus for open end spinning from staple fibers. 3,924,398, Cl. 57-58.890.
Etablissement Public: Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Marechal, Robert Gaston Andre; and Fortunato, Gerard, 3,924,952.
Trombe, Jean-Christian; and Montel, Gerard, 3,925,062.
Etablissement Public: Centre National de la Recherche Scientifique: *See*—
Gastambide, Bernard; Thal, Claude; Rohrbach, Phillippe; and Laroche, Marie-Jeanne, 3,925,480.
Ethicon, Inc.: *See*—
Walldorf, Diann J., 3,924,630.
Ethyl Corporation: *See*—
Lanier, Carroll W., 3,925,448.
Shin, Kju Hi, 3,925,488.
Stephens, Ruth E., 3,925,253.
Ett, Allen Harold: *See*—
Chaires, Anne Marie; Ciconte, Jean Marie; Ett, Allen Harold; Hilliard, John Joseph; and Rosenbaum, Walter Steven, 3,925,761.
Etter, Berwyn E. Method and means for applying additives to industrial gas. 3,924,648, Cl. 137-3.000.
Ettischer, Helmut, to Eastman Kodak Company. Exposure control apparatus for a photographic camera having interchangeable lenses. 3,925,797, Cl. 354-197.000.
Eustance, John W., to General Electric Company. Stabilized ester impregant. 3,925,221, Cl. 252-63.700.
Evans, David John Ivor: *See*—
Weir, Donald Robert; and Evans, David John Ivor, 3,925,533.
Everhardt, William F.; Brown, Henry L., Jr.; and Dennis, Clement O., Sr., to American Power Tread Corporation. Modular curing chamber. 3,925,005, Cl. 432-82.000.
Everitt, Delmar K.: *See*—
Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., 3,924,352.
Evers, Albert Leo, to Apostol, Frank. Fishing equipment. 3,924,346, Cl. 43-26.200.
Ewers, Josef: *See*—
Voges, Heinz-Werner; and Ewers, Josef, 3,925,378.
Exploaterings Aktiebolaget T.B.F.: *See*—
Porath, Jerker Olof; and Janson, Jan-Christer, 3,925,152.
Exxon Research & Engineering Company: *See*—
Cheysson, Philippe Jean-Marie; Verney, Paul Jean; and Coquard, Michel Alain, 3,925,204.
Jervis, Graham James; and Robson, Robert, 3,925,215.
Lundberg, Robert D.; and Makowski, Henry S., 3,925,280.
Moreau, James O.; and Halko, Richard A., 3,924,449.
Parker, Paul T.; and Mayer. Ivan, 3,925,318.
Salooja, Kailish Chander, 3,925,001.
Sinfelt, John H.; and Carter, James L., 3,925,196.
Eylens, Rudolf: *See*—
Jargon, Franz; Maschke, Erich; and Eylens, Rudolf, 3,925,171.
F. B. Mercer Limited: *See*—
Martin, Keith Fraser, 3,924,522.

F-S Inc.: *See—*
Anderson, Norman C.; and Rupert, Robert E., 3,925,668.

Fabris, Hubert Jakob; and Maxey, Edwin Morgan, to General Tire & Rubber Company, The. Flexible polyetherurethane foams with improved resilience. 3,925,266, Cl. 260-2.5AM.

Faessinger, Robert W.: *See—*
Brickman, W. James; and Faessinger, Robert W., 3,925,274.

Fagg, Charles R., to United States of America, Army. Removable lockplate to preclude selection of automatic firing. 3,924,512, Cl. 89-128.000.

Fahey, Darryl R., to Phillips Petroleum Company. Ruthenium complexes as catalysts for reduction of polyenes. 3,925,494, Cl. 260-666.00A.

Fahey, Dennis M., to PPG Industries, Inc. Sizing, coating and combined sizing and coating composition for glass fibers. 3,925,286, Cl. 260-29.300.

Fahlstrom, Per Anders Herman Henningsson; and Jonsson, Erik Alfon, to Boliden Aktiebolag. Arrangement in grinding mills. 3,924,814, Cl. 241-80.000.

Fahnstrom, Dale E.: *See—*
Andrus, Edward R., Jr.; Fahnstrom, Dale E.; Hansen, James G.; and Nichols, Charles E., 3,924,309.

Fairchild Industries, Inc.: *See—*
Lemont, Harold E., 3,924,965.

Falk, James B. High deflection constant speed universal joint. 3,924,420, Cl. 64-21.000.

Far-Mar-Co., Inc: *See—*
Rao, Ganta V.; and Gerrish, Oliver B., Sr., 3,925,568.

Faroni, Charles C., to Amerace Corporation. Fastener apparatus. 3,924,507, Cl. 85-9.00R.

Farrell, Sherman R.; and Loda, Gary K., to Systems, Science and Software. Electron beam irradiation of materials using rapidly pulsed cold cathodes. 3,925,670, Cl. 250-400.000.

Fasco Industries, Inc.: *See—*
Muench, Rudolph E., 3,925,742.

Fassel, Velmer A.: *See—*
D'Silva, Arthur P.; and Fassel, Velmer A., 3,925,674.

Fattinger, Volker, to Ciba-Geigy Corporation. Gas scrubbing plant. 3,925,040, Cl. 55-257.000.

Fatzer, Elmer G.; and Kochka, Edgar L., to Westinghouse Electric Corporation. Silicon carbide coated graphite members and process for producing the same. 3,925,577, Cl. 427-249.000.

Faubourg de l'Hospital: *See—*
Meister, Rene; and Tyrode, Alain, 3,925,693.

Favie, Claude: *See—*
Agouri, Elias; Favie, Claude; and Rebeille, Jean-Claude, 3,925,508.

Favillier, Louis: *See—*
Fontaine, Paul Isidore; and Favillier, Louis, 3,925,059.

Fawcett, John L.: *See—*
Tschudy, Donald B.; and Fawcett, John L., 3,924,291.

Feightner, Lewis Clark, to New Twist Connector Corporation. Electrical-pin-and-socket connector. 3,924,921, Cl. 339-252.00P.

Fein, Michael E.; and Hinson, David C., to Owens-Illinois, Inc. Helium-xenon gas mixture for gas discharge device. 3,925,697, Cl. 313-223.000.

Feiner, Alexander: *See—*
Angner, Ronald Joseph; and Feiner, Alexander, 3,925,625.

Felt Products Mfg. Co.: *See—*
Czernik, Daniel E.; and McDowell, Donald J., 3,924,907.

Ferchland, Harold W., to General Motors Corporation. Assembly method for rotary engine. 3,924,314, Cl. 29-156.40R.

Ferkl, Frantisek: *See—*
Esser, Miroslav; Ledr, Zdenek; Ferkl, Frantisek; Kubovy, Miloslav; Ripka, Josef; Hortlik, Frantisek; and Elias, Jiri, 3,924,398.

Ferlazzo, Natale; Buzzi, Gian Fausto; and Ghirga, Marcello, to Societa Italiana Resine S.I.R. S.p.A. Process for the production of methyl acrylate. 3,925,463, Cl. 260-486.00R.

Fernandez-Rana, Victoriano: *See—*
Wise, James C.; and Fernandez-Rana, Victoriano, 3,924,845.

Ferodo Limited: *See—*
Stirling, Walter Robert; Ellis, Christopher Robinson; and Silvester, Brian Carol, 3,924,712.

Ferrara, Rudolph A., to General Motors Corporation. Ventilated vehicle seat. 3,924,893, Cl. 297-455.000.

Ferro, Antonio, to Crinospitál S.p.A. Aspiration and infusion needle. 3,924,617, Cl. 128-221.000.

Few, Arthur A., to United States of America, Navy. Electric field sensor. 3,925,726, Cl. 324-72.000.

Fidenza Vetraria S.p.A.: *See—*
Magnani, Eugenio, 3,924,772.

Fiedelman, Howard W., to Morton-Norwich Products, Inc. Process for producing salt having a reduced calcium sulfate content. 3,925,027, Cl. 23-296.000.

Fieldhouse, John W.: *See—*
Hausch, Walter R.; Fieldhouse, John W.; and Kay, Edward L., 3,925,590.

Fielding, Herbert L.; and Liggero, Samuel H., to Polaroid Corporation. Multicolor screen element containing a hydrophilic colloid treated with a basic dye and zirconium acetate. 3,925,082, Cl. 96-76.00R.

Figari, Jorge Galvez. Method and apparatus for enriching irrigation water. 3,924,353, Cl. 47-1.000.

Figura, William L., to Jacobsen Manufacturing Company. Truck vehicle. 3,924,706, Cl. 180-89.00A.

Filippini, Ronald A.: *See—*
Sandor, Louis; Germain, Andrew Gerald; Wiles, Donald Ray; and Filippini, Ronald A., 3,924,422.

Fillmore, William E., to Owens-Illinois, Inc. Single use safety closure. 3,924,769, Cl. 215-216.000.

Finn, John E.: *See—*
Hanson, Violet M.; and Finn, John E., 3,924,521.

Finnell, Ned W. Method of curing and drying wild rice. 3,925,564, Cl. 426-418.000.

Fiorini, Dante M.: *See—*
Utman, Leslie H.; and Fiorini, Dante M., 3,924,878.

Firestone Tire & Rubber Company, The: *See—*
Hausch, Walter R.; Fieldhouse, John W.; and Kay, Edward L., 3,925,590.
Yang, James H. C.; and Beneze, Heinz W., 3,924,982.

Firtion, Victor Andrew; Rongved, Leif; and Saunders, Thomas Edward, to Bell Telephone Laboratories, Incorporated. Pattern generating apparatus. 3,925,785, Cl. 346-1.000.

Fisch, Richard S.; and Newman, Norman, to Minnesota Mining and Manufacturing Company. Electrodialysis of fixer containing solutions. 3,925,175, Cl. 204-109.000.

Fischbeck, Kenneth Henry; and Leyton, Eric McPhail, deceased (by Leyton, Sheila, executrix), to RCA Corporation. Fluid ejection or control device. 3,924,974, Cl. 417-322.000.

Fischer, Adolf; Hamprecht, Gerhard; Mangold, Dietrich; and Rohr, Wolfgang, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Substituted O-(aminosulfonyl)-glycolic anilides. 3,925,439, Cl. 260-456.00A.

Fishbeck, Kenneth Henry, to RCA Corporation. Image generator having a plurality of marker units operated in a predetermined sequence to inhibit the formation of patterns. 3,925,790, Cl. 346-140.000.

Fisher, Philip H.: *See—*
Benner, Robert A.; Fisher, Philip H.; and Parlette, Carl L., 3,924,565.

Fitton, Peter; and Whitesides, Thomas, to Hoffmann-La Roche Inc. Catalyst for preparation of 6-methyl-1,5-heptadiene. 3,925,249, Cl. 252-430.000.

Fitzgerald, Maurice J., to Polaroid Corporation. Synthetic silver halide emulsion binder. 3,925,083, Cl. 96-114.000.

Fives-Cail Babcock: *See—*
Vaillant, Christian; and Menissez, Jean Pierre, 3,924,876.

Fletcher, Gerald M., to Xerox Corporation. Segmented biased transfer member. 3,924,943, Cl. 355-3.00R.

Flinchum, Charles; Dunbar, F. Curtiss; and Arnold, Jerry L., to Armco Steel Corporation. Method of coating low alloy steels. 3,925,579, Cl. 427-320.000.

Flinth, Rune; and Nordstrom, Kjell, to Conscale AB. Belt conveyor weighing system. 3,924,729, Cl. 198-39.000.

Flucke, Winfried: *See—*
Wollweber, Hartmund; and Flucke, Winfried, 3,925,470.
Wollweber, Hartmund; and Flucke, Winfried, 3,925,471.

Flume Stabilization Systems, Inc.: *See—*
Napolitano, Pellegrino E., 3,924,555.

FMC Corporation: *See—*
Brown, William R., 3,924,730.

Fohrhaltz, Howard A.; and Blackburn, Richard D., to General Electric Company. Wear indicator for vacuum circuit interrupter. 3,925,722, Cl. 324-28.00R.

Fontaine, Paul Isidore; and Favillier, Louis, to International Nickel Company, Inc., The. Foundry processes and metallurgical addition agents therefor. 3,925,059, Cl. 75-10.00R.

Food Technology, Inc.: *See—*
Glabe, Elmer F.; Anderson, Perry W.; and Laftsidis, Stergios, 3,925,559.

Force Control Industries, Inc.: *See—*
Cory, Halsey W., 3,924,715.

Ford Motor Company: *See—*
Bray, Stewart V., 3,924,492.
Otterstetter, Charles H., 3,924,810.
Schowiak, Duane C., 3,924,806.
Striker, David L., 3,925,809.
Woodward, Gary F.; and Vanderberg, Lawrence J., 3,925,747.

Formax Manufacturing Corporation: *See—*
McAleer, Howard J., 3,924,362.

Formica International Ltd.: *See—*
Shaul, Anthony James; and Wood, Edward Russell, 3,925,138.

Forrest Paschal Machinery Co.: *See—*
Milholen, William F.; and Lineberry, Cletus E., 3,924,756.

Forrester, Howard M: *See—*
Dick, John O.; and Forrester, Howard M, 3,924,536.

Forschirm, Alex S.; and Wissbrun, Kurt F., to Celanese Corporation. Cationic dyeable cellulose esters with improved dyeability. 3,925,006, Cl. 8-4.000.

Forschungsinstitut Bergof GmbH: *See—*
Schumann, Wilhelm; and Strathmann, Heinrich, 3,925,211.

Forslund, Erik Torsten: *See—*
Lindblom, Karl Thore; and Forslund, Erik Torsten, 3,924,704.

Fortier, Germain, to Emile Fortier Inc. Joint for window shutter. 3,924,956, Cl. 403-231.000.

Fortunato, Gerard: *See—*
Marechal, Robert Gaston Andre; and Fortunato, Gerard, 3,924,952.

Foss, William I.: *See—*
Ward, William J., III; and Foss, William I., 3,925,037.

Foster Wheeler Energy Corporation: *See—*
Kutler, Andrew A.; and Keegel, Joseph F., Jr., 3,925,003.

Zipay, Albert John, 3,924,575.

Fox, Edward I., to H. W. Crane Company. Control actuator for gear belts and the like. 3,924,301, Cl. 24-31.00L.

Fox, Edward I., to H. W. Crane Company. Limit stop or finger for chain or belt control. 3,924,488, Cl. 74-568.00R.

Franceschina, Louis E.; Haromy, Fred; and Kruppert, Frederick W., to Algoma Steel Corporation, Limited, The. Device for inserting plugs in a plug mill. 3,924,435, Cl. 72-209.000.

Frank, Irving G., to Weatherhead Company, The. Hose coupling. 3,924,883, Cl. 285-256.000.

Frank, Stanley L.; and Dobrosielski, Stephen S., to Westinghouse Electric Corporation. Pushbutton switch with separable switch units. 3,925,632, Cl. 200-307.000.

Franke, Hans G., to Chevron Research Company. Alkylation of N-acyl-O-hydrocarbylphosphoroamidothioate salts. 3,925,520, Cl. 260-979.000.

Franzen, Gustav; and Veltges, Helmut, to Palitex Project Company G.m.b.H. Apparatus for mounting portable manually operated yarn knotter mechanisms on yarn processing machines. 3,924,392, Cl. 57-34.00R.

Fraser, David Bruce, to Bell Telephone Laboratories, Incorporated. Platinum oxide lithographic masks. 3,925,677, Cl. 250-505.000.

Frater, Georg; Greuter, Hans; and Schmid, Hans, to Hoffmann-La Roche Inc. Tricyclo[5,3,1,$0^{3,8}$]undecan-2-ones and the corresponding mono- and di-unsaturated derivatives. 3,925,477, Cl. 260-586.00G.

Frater, Georg; Greuter, Hans; and Schmid, Hans, to Hoffmann-La Roche Inc. Tricyclo (5,4,0,$0^{3,9}$)undecan-2-ones. 3,925,479, Cl. 260-586.00G.

Frater, Georg: *See—*
Greuter, Hans; Frater, Georg; and Schmid, Hans, 3,925,486.

Freeman, Michael Alexander Reykers; and Swanson, Sydney Alan Vasey, to National Research Development Corporation. Knee joint prosthesis. 3,924,277, Cl. 3-1.911.

Freethy, Ralph Charles. Apparatus for transmitting information regarding monetary transactions. 3,925,619, Cl. 179-6.30R.

French, Joseph Charles; Nigam, Anant Kumar; and Sessler, Gerhard Martin, to Bell Telephone Laboratories, Incorporated. Graphic communications tablet. 3,925,610, Cl. 178-18.000.

Freytag, Arthur H.; and Linden, James C., to Great Western Sugar Company, The. Stimulation of sugar diffusion from plant tissue with the use of ethylene, ethylene precursors, and analogs. 3,925,097, Cl. 127-44.000.

Frhr. von Andrian-Werburg, Hanns: *See—*
Heimke, Gunther; Griss, Peter; and Frhr. von Andrian-Werburg, Hanns, 3,924,274.

Friedenberg, Robert; Reese, William; and Reading, William H., III. Detector device and process for detecting ovulation. 3,924,609, Cl. 128-2.10R.

Friedland, Bernard; and Stiles, John C., to Singer Company, The. Angular rate sensor. 3,924,474, Cl. 73-505.000.

Friedrich Deckel Aktiengesellschaft: *See—*
Lanzenberger, Horst, 3,924,479.

Friedrichsfeld GmbH Steinzeug-und Kunststoffwerke: *See—*
Heimke, Gunther; Griss, Peter; and Frhr. von Andrian-Werburg, Hanns, 3,924,274.
Heimke, Gunther; Griss, Peter; and von Andrian-Werburg, Hanns Frhr., 3,924,275.

Friend, Lindsay Carlton, to Du Pont de Nemours, E. I., and Company. Daughter board contact. 3,924,918, Cl. 339-17.00M.

Frierdich, Richard D.: *See—*
Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., 3,924,352.

Fries, John A.: *See—*
Davis, Irwin; Skoultchi, Martin M.; and Fries, John A., 3,925,282.

Fritz Burkle KG, Firma: *See—*
Burkle, Fritz, Jr., 3,924,418.

Froeschmann, Rasmus; and Sprugel, Friedrich, to Optimol-Oelwerke GmbH. Sulfur and phosphorus bearing lubricant. 3,925,213, Cl. 252-18.000.

Frohberger, Paul-Ernst: *See—*
Buchel, Karl Heinz; Frohberger, Paul-Ernst; Scheinpflug, Hans; and Enders, Edgar, 3,925,551.
Grohe, Klaus; and Frohberger, Paul-Ernst, 3,925,400.

Fuchs, Francis Joseph, Jr., to Western Electric Company, Inc. Method and apparatus for reducing extrusion start-up pressure. 3,924,429, Cl. 72-60.000.

Fuchs, Hermann: *See—*
Meininger, Fritz; Hoyer, Ernst; and Fuchs, Hermann, 3,925,351.

Fuji Photo Film Co., Ltd.: *See—*
Sato, Akira; Shiba, Keisuke; and Hinata, Masanao, 3,925,084.
Sato, Akira; Ogawa, Akira; Shiba, Keisuke; and Hinato, Masanao, 3,925,085.
Sugi, Ichirow; Takenaka, Haruo; Okiyama, Toshiaki; and Kobayashi, Teruo, 3,925,573.

Fuji Photo Optical Co., Ltd.: *See—*
Toyama, Seiji; Yoshikawa, Kazuo; and Higuchi, Takeshi, 3,925,813.

Fuji Xerox Co., Ltd.: *See—*
Murakami, Shin-Ichi, 3,924,848.
Murakami, Shinichi, 3,924,849.

Fujihira, Kenji: *See—*
Watanabe, Jinzo; Terao, Noboru; Kamahara, Koichi; Miyashita, Kazuhisa; and Fujihira, Kenji, 3,925,802.

Fujinami, Akira: *See—*
Tottori, Nobumasa; Kato, Toshiro; Asano, Yasuhisa; Ueda, Minoru; Kirino, Osamu; Ooba, Shigehiro; Fujinami, Akira; and Ozaki, Toshiaki, 3,925,554.

Fujisawa, Hiroshi: *See—*
Okada, Hiroaki; Fujisawa, Hiroshi; Fujita, Masahiko; Shimamoto, Tsugio; and Nomura, Hiroaki, 3,925,357.

Fujita, Masahiko: *See—*
Okada, Hiroaki; Fujisawa, Hiroshi; Fujita, Masahiko; Shimamoto, Tsugio; and Nomura, Hiroaki, 3,925,357.

Fukuda, Hideo: *See—*
Nara, Kiyoshi; Katamoto, Kazuyoshi; Ohta, Kazuhiko; and Fukuda, Hideo, 3,925,465.

Fukuda, Kenji: *See—*
Honkawa, Tadashi; and Fukuda, Kenji, 3,924,949.

Fukuhara, Akira, to Hitachi, Ltd. Holographic memory utilizing a changeable phase object and coherent subtraction. 3,924,924, Cl. 350-3.500.

Fukushima, Iwao: *See—*
Takahashi, Noboru; Nakamura, Mutsuaki; Ozaki, Sadao; Isono, Hiromasa; and Fukushima, Iwao, 3,925,114.

Fukushima, Seitaro; and Kawahara, Kiyoshi, to Mitsubishi Kinzoku Kabushiki Kaisha. Process for recycling chlorine gas in the chlorination treatment of iron oxide ores containing titanium. 3,925,057, Cl. 75-1.00T.

Fulcher, John R.: *See—*
Holman, Frank Brouwer, 3,924,571.

Fulier, Josef, to Vyskumny ustav mechanizacie a automatizacie. Apparatus for shaping hollow metal bodies. 3,924,434, Cl. 72-208.000.

Fulks, David G.: *See—*
Walker, Frank H.; Blumer, Larry D.; Khouri, Robert N.; and Fulks, David G., 3,924,483.

Fullmer, Blaine L.: *See—*
Eckhoff, David W.; and Fullmer, Blaine L., 3,925,198.

Fulton, Garland L.: *See—*
Bradley, Robert C.; and Fulton, Garland L., 3,925,209.

Furbeck, Warren R., to International Paper Company. Paperboard carton. 3,924,797, Cl. 229-17.00G.

Furbeck, Warren R.: *See—*
Lee, Charles A.; and Furbeck, Warren R., 3,925,142.

Furer, Benya Elievich: *See—*
Mogilevsky, Vitaly Moritsovich; Deriga, Nikolai Filippovich; Ekimov, Vadim Petrovich; Erastov, Alexandr Petrovich; Posokhin, Viktor Vladimirovich; and Furer, Benya Elievich, 3,925,725.

Furukawa Electric Co., Ltd.: *See—*
Matsui, Kazumi; Umemori, Takashi; Matsuura, Kenji; Hosoda, Yoshikado; Nishikawa, Tadashige; and Tawara, Makoto, 3,924,537.

Furuno Electric Company, Ltd.: *See—*
Tanaka, Hideki; Watanabe, Mikio; Handa, Minoru; Inouchi, Mitsuhiro; Yoshioka, Shigeru; and Ishida, Kazutaka, 3,925,732.

Furutu, Akira, to Japan Bono'k Co., Ltd. Tag attacher. 3,924,788, Cl. 227-67.000.

Fuveau S.A.: *See—*
Karadavidoff, Isaac; and Moreau, Michele, 3,925,552.

Fuziwara, Yutaka: *See—*
Kushihashi, Akira; Fuziwara, Yutaka; and Akashi, Naotomo, 3,925,050.

G & H Technology, Inc.: *See—*
Cooper, Earl A.; and Stephenson, Roger C., 3,924,688.

G. T. Schjeldahl Company: *See—*
Anderson, Donald E., 3,924,604.

Gaffney, William, to Mintz, Charlotte. Plastic bag with handles. 3,924,802, Cl. 229-54.00R.

Gaines, Marvin E.; and Swadner, Robert L., to General Motors Corporation. Radial compressor with muffled gas chambers and short stable piston skirts and method of assembling same. 3,924,968, Cl. 417-53.000.

Gale, Michael Thomas; and Greenaway, David, to RCA Corporation. Focussed image hologram projector using a long narrow light source. 3,924,925, Cl. 350-3.500.

Galitsky, Jury Petrovich. Spirometer and anenometer apparatus. 3,924,611, Cl. 128-2.080.

Gallo, Thomas: *See—*
Hampton, Richard John; Rolland, Jacques Robert; and Gallo, Thomas, 3,925,343.

Galvani, Mary M. Fecal streptococci speciating media. 3,925,161, Cl. 195-100.000.

Gamma Engineering Limited: *See—*
Vertesi, Tibor Miklos, 3,924,673.

Ganslaw, Stuart Harold; and Walker, James L., to National Starch and Chemical Corporation. Process for preparing salt stable latices. 3,925,288, Cl. 260-29.6TA.

Gardner, Jeffrey M.; and Pilz, William M., to Container Corporation of America. Expandable display tray. 3,924,734, Cl. 206-44.00R.

Garrett, John A.: *See—*
Neville, Richard Ernest Gartside; and Garrett, John A., 3,924,645.

Garrison, Eldon. Slump indicator. 3,924,447, Cl. 73-54.000.

Garth, Bruce Hollis, to Du Pont de Nemours, E. I., and Company. Anticing composition. 3,925,030, Cl. 44-56.000.

Gaske, Joseph E., to DeSoto, Inc. Radiation curable non-gelled Michael addition reaction products. 3,925,349, Cl. 204-159.150.

Gaskill, James R., Jr.; and Devendorf, Don C., to Hughes Aircraft Company. Universal logic gate. 3,925,684, Cl. 307-203.000.

Gaskill, James R., Jr.; and Devendorf, Don C., to Hughes Aircraft Company. Cascode node idle current injection means. 3,925,691, Cl. 307-300.000.

Gastambide, Bernard; Thal, Claude; Rohrbach, Phillippe; and Laroche, Marie-Jeanne, to Etablissement Public: Centre National de la Recherche Scientifique. Novel 16,17α and 17,17α diketo-D-homosteroids and their method of preparation. 3,925,480, Cl. 260-586.00E.

Gates, Charles R. Folding screen for light permeable skylights and the like. 3,924,671, Cl. 160-183.000.

Gaudiano, Anthony V.: *See—*
Banjavich, Mark P.; and Gaudiano, Anthony V., 3,924,616.
Banjavich, Mark P.; and Gaudiano, Anthony V., 3,924,618.
Banjavich, Mark P.; and Gaudiano, Anthony V., 3,924,619.

Gavrilovic, Dragan Milan, to RCA Corporation. Novel liquid crystal electro-optic devices. 3,925,238, Cl. 252-299.000.

Gavrilovic, Dragan Milan: *See—*
Ross, Daniel Louis; and Gavrilovic, Dragan Milan, 3,925,237.

Gay, Leslie W., to NCR Corporation. Multiple digit display employing single digit readout. 3,925,775, Cl. 340-324.00R.

Gay, Sandy C.: *See—*
Korrell, Melvin H.; and Gay, Sandy C., 3,924,833.

Gaynor, Joseph, to Bell & Howell Company. Resolution thermal spirit masters apparatus. 3,924,530, Cl. 101-141.000.

Gaynor, Joseph, to Bell & Howell Company. Resolution thermal spirit masters method. 3,924,533, Cl. 101-467.000.

Gdula, Robert A.; Raider, Stanley I.; and Revitz, Martin, to International Business Machines Corporation. Method of stabilizing MOS devices. 3,925,107, Cl. 148-1.500.

Gebauer, Herbert: *See—*
Kleimann, Helmut; von Bonin, Wulf; Schneider, Heinz-Georg; and Gebauer, Herbert, 3,925,527.

Geier, Bernd, to Daimler-Benz Aktiengesellschaft. Installation for detachable fastening or rear seat cushions in passenger motor vehicles. 3,924,892, Cl. 297-440.000.

Geiger, Friedhelm; Heimberger, Werner; Schreyer, Gerd; and Weigert, Wolfgang, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for production of cyanuric chloride. 3,925,377, Cl. 260-248.00C.

Gelbein, Abraham P., to Lummus Company, The. Production of nitriles. 3,925,447, Cl. 260-465.00C.

General Electric Company: *See—*
Albinger, Harry, Jr., 3,925,629.
Betts, Joseph Elwood; Ott, William Michael, Jr.; and Vaum, Howard Thomas, 3,924,985.
Canney, Robert S., 3,925,744.
Cooper, Glen D.; and Abolins, Visvaldis, 3,925,509.
Elsworth, Robert M., 3,924,780.
Eustance, John W., 3,925,221.
Fohrhaltz, Howard A.; and Blackburn, Richard D., 3,925,722.
Heitlinger, Louis J.; Bahr, John P.; Smith, John H.; and Anderson, Thomas W., 3,925,762.
Klepfer, Harold H., 3,925,151.
Lampe, Warren R., 3,925,277.
Merrill, Duane F., 3,925,276.
Misiura, Thaddeus Dominick; Vostovich, Joseph Edward; and Wahl, Ralph Edward, 3,925,597.
Nelson, Philip H., Jr., 3,924,840.
Nuss, James J., 3,924,601.
Sherman, Ralph R., Jr., 3,925,714.
Ward, William J., III; and Foss, William I., 3,925,037.
Woodbury, Henry H.; and Lewandowski, Robert S., 3,925,108.

General Instrument Corporation: *See—*
Rubenstein, Richard B., 3,925,689.

General Mills Chemicals, Inc.: *See—*
Swanson, Ronald R., 3,925,472.

General Mills, Inc.: *See—*
Straughn, Robert O.; Elofson, Gary L.; and Reinhart, Richard D., 3,925,563.

General Motors Corporation: *See—*
Anders, Robert; and Kussow, Daniel H., 3,924,545.
Auman, John T.; Rogers, Wesley A.; and Jones, Trevor O., 3,925,753.
Beiswenger, David W.; Paddock, Gordon R.; and Ranft, Ernst L., 3,924,408.
Bond, William D.; and Zemke, Bruce E., 3,924,591.
Bray, Martin L.; Cole, Edward N.; and Haggart, James A., Jr., 3,925,026.
Brewer, Robert W., 3,924,716.
Ferchland, Harold W., 3,924,314.
Ferrara, Rudolph A., 3,924,893.
Gaines, Marvin E.; and Swadner, Robert L., 3,924,968.
Heidorn, John Henry, 3,924,417.
Heilman, Gerald D.; Paddock, Gordon R.; and Ranft, Ernst L., 3,924,409.
Irwin, John A., 3,924,403.
Jensen, William K., 3,925,752.
Johnston, Ralph H.; and Lakey, Leroy E., 3,924,970.
Julian, Clarence L.; and Young, Robert E., 3,924,586.
Koivunen, Erkki A., 3,924,577.
Murphy, Michael P., 3,924,587.
Raby, Virgil W., 3,925,695.
Rose, Dale P., 3,924,979.
Siewert, Robert M., 3,924,576.
Verdouw, Albert J., 3,925,002.
Walker, Frank H.; Blumer, Larry D.; Khouri, Robert N.; and Fulks, David G., 3,924,483.

General Signal Corporation: *See—*
Engle, Thomas, 3,924,902.

General Steel Industries, Inc.: *See—*
Podgajny, Thaddeus W., 3,924,540.

General Time Corporation: *See—*
Robinson, Ralph C., 3,924,399.

General Tire & Rubber Company, The: *See—*
Fabris, Hubert Jakob; and Maxey, Edwin Morgan, 3,925,266.

George, Peter K., to Rockwell International Corporation. Disk generator. 3,925,769, Cl. 340-174.0TF.

George, William D.; and Shen, Chin-Wen, to Getty Oil Company. Method for enhancing the recovery of oil using steam stimulation process. 3,924,683, Cl. 166-303.000.

Gerard, Bernard, to Rhone-Poulenc S.A. Process for the preparation of thermosetting polymers from N,N-bis-maleimide. 3,925,324, Cl. 260-78.0UA.

Gerlt, Charles: *See—*
Cauceglia, Walter Bartholomew; Gerlt, Charles; and Peralta, Luis Arturo, 3,924,370.

Germain, Andrew Gerald: *See—*
Sandor, Louis; Germain, Andrew Gerald; Wiles, Donald Ray; and Filippini, Ronald A., 3,924,422.

Gerner, Daniel F., to Packaging Coordinators, Inc. Packaging. 3,924,747, Cl. 206-531.000.

Gerrish, Oliver B., Sr.: *See—*
Rao, Ganta V.; and Gerrish, Oliver B., Sr., 3,925,568.

Gerstenhaber, Suzanne. Message communicator for handicapped persons. 3,925,779, Cl. 340-337.000.

Gertsch AG: *See—*
Koos, Josef, 3,924,867.
Koos, Josef, 3,924,868.
Schweizer, Gottfried, 3,924,866.
Weigl, Erwin, 3,924,864.

Gesser, Hymie D.; and Warriner, Robert E. Contact lenses. 3,925,178, Cl. 204-165.000.

Getty Oil Company: *See—*
George, William D.; and Shen, Chin-Wen, 3,924,683.

Geus, John W., to Stamicarbon B.V. Process and catalyst for the preparation of ketones and/or aldehydes from olefines. 3,925,481, Cl. 260-597.00R.

Ghirga, Marcello: *See—*
Ferlazzo, Natale; Buzzi, Gian Fausto; and Ghirga, Marcello, 3,925,463.

Ghosh, Subrata, to Chrysler Corporation. Heat resistant alloys. 3,925,071, Cl. 75-170.000.

Giacobazzi, Valeriano, to Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A. Machine for continuously spinning and treating rayon-viscose filaments and yarns. 3,924,984, Cl. 425-68.000.

Giacopelli, Umberto, to Solvay & Cie. Electrolysis cell with vertical bipolar electrodes. 3,925,186, Cl. 204-256.000.

Gibbs, John Reynell. Bed. 3,924,281, Cl. 5-81.00R.

Gibbs, Louis L. Easily erected roof structure for modular buildings. 3,924,366, Cl. 52-69.000.

Giblin, James P.: *See—*
Bernier, Louis E.; and Giblin, James P., 3,925,529.

Gibson Associates Incorporated: *See—*
Kachur, Nicholas W.; and Tomburo, Anthony F., 3,924,741.

Gibson, James Andrew: *See—*
Anderson, Robert Craig; and Gibson, James Andrew, 3,924,644.

Gibson, Joseph D.: *See—*
Cook, Koy B., Jr.; Davidson, Jimmy L.; Gibson, Joseph D.; and Patterson, Raymond B., III, 3,924,321.

Gilbert, Glen A.; and Hobbs, James, to Butler National Corporation. Air traffic control system. 3,925,750, Cl. 340-27.0NA.

Gill, Clyde E., to Lennon Manufacturing Inc. Door. 3,924,377, Cl. 52-620.000.

Gillchriest, William C., to Smyth, Roston & Pavitt. Boronated tetracycline compounds. 3,925,432, Cl. 260-429.700.

Giras, Theodore C.: *See—*
Berman, Paul A.; Giras, Theodore C.; and Crews, Roy E., 3,925,679.

Giroux, Eugene L.: *See—*
Henkin, Robert I.; and Giroux, Eugene L., 3,925,547.

GKN Transmissions Limited: *See—*
Pagdin, Brian Colin, 3,924,593.

Glabe, Elmer F.; Anderson, Perry W.; and Laftsidis, Stergios, to Food Technology, Inc. Animal feeds for herbivorous domestic animals. 3,925,559, Cl. 426-2.000.

Glasow, Peter, to Siemens Aktiengesellschaft. Stripline radiation detection apparatus. 3,925,669, Cl. 250-370.000.

Global Marine Inc.: *See—*
Blankenship, Owen D., 3,924,896.

Globus, Seymour: *See—*
Kohrn, Edward Louis; and Globus, Seymour, 3,925,066.
Kohrn, Edward Louis; and Globus, Seymour, 3,925,073.

Gloxhuber, Christian: *See—*
Ploger, Walter; Schmidt-Dunker, Manfred; and Gloxhuber, Christian, 3,925,456.

Gluckin, Gerald: *See—*
Boser, Ronald; and Gluckin, Gerald, 3,924,550.

Gnirrep, Thomas B.: *See—*
Bergman, Steven C.; Gnirrep, Thomas B.; and Nazzaro, Charles A., 3,925,644.

Gogush, Michael. Elevating mechanism for the roofs or tops of vans and the like. 3,924,889, Cl. 296-137.00B.

Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., to Goldfarb, Adolph E.; and Benkoe, Erwin. Toy vehicle. 3,924,352, Cl. 46-202.000.

Goldmacher, Joel Edward; and McCaffrey, Michael Thomas, to RCA Corporation. Electro-optic compositions and device. 3,925,236, Cl. 252-299.000.

Gomei Kaisha Touyo Shoji: *See—*
Yoshioka, Yoshihide, 3,925,127.

Gonzalez, Luis G., to Raymond Lee Organization, Inc., The, a part interest. Smoking pipe holder. 3,924,735, Cl. 206-45.110.

Goodyear Tire & Rubber Company, The: *See—*
Candle, Richard D., 3,924,363.
Gregg, Michael J. W., 3,924,481.
Hunter, Edward E.; and Rye, Grover W., 3,924,569.

Goosen, Richard H. Marking template. 3,924,331, Cl. 30-366.000.

Goralski, Christian T.; and Klingler, Thomas C., to Dow Chemical Company, The. 1-(Arylthio) methanesulfonamides. 3,925,468, Cl. 260-556.00A.

Gordon, James F., to Gordon Torquer, Ltd. Low friction, controlled leakage rotary engine. 3,924,980, Cl. 418-191.000.

Gordon Torquer, Ltd.: *See—*
Gordon, James F., 3,924,980.

Goren, Yoram; and Springett, Charles N., to Santa Fe International Corporation. Column stabilized semisubmersible pipelaying barge. 3,924,415, Cl. 61-72.300.

Gotham, Robert W.; and McKnight, Robert J., to Unex Conveying Systems, Inc. Roller with inserted ball bearings. 3,924,908, Cl. 308-20.000.

Gothrup, James Pershing. Carrier bracket for attaching a bicycle relative to a motor vehicle's bumper. 3,924,787, Cl. 224-42.03B.

Graff, Kenneth W., to ICI United States Inc. Wash-durable antistatic agent. 3,925,462, Cl. 260-471.00C.

Graham, Ward A.: *See—*
Putney, David H.; and Graham, Ward A., 3,925,501.

Gram, Hans, to Brodrene Gram A/A. Apparatus for stacking oblong articles. 3,924,758, Cl. 214-7.000.

Grandmont, Joseph L. Box buckle for wrist-watch band. 3,924,304, Cl. 24-163.00K.

Grard, Charles: *See—*
Chabardes, Pierre; Grard, Charles; and Schneider, Charles, 3,925,485.

Grassme, Ulrich: *See—*
Soder, Eickhardt; and Grassme, Ulrich, 3,925,672.

Grau, Dietrich; Beigel, Franz; and Blanz, Roland. Apparatus for locking a container on a base member, preferably a carriage. 3,924,544, Cl. 105-366.00B.

Gravel, Charles L.: *See—*
Kurtz, Anthony D.; Brosh, Amnon; Gravel, Charles L.; and Mallon, Joseph R., 3,924,322.

Gravesteijn, Elbert, to Heineken Technisch Beheer B.V. Method of bringing a plurality of containers in transportable condition by means of a carrier member and an assembly obtained by application of said method. 3,924,739, Cl. 206-157.000.

Grayson, Richard Davis, to International Telephone and Telegraph Corporation. Oven valve circuit and thermostatic actuator thereof. 3,925,746, Cl. 337-309.000.

Great Western Sugar Company, The: *See—*
Freytag, Arthur H.; and Linden, James C., 3,925,097.

Green, Richard L.; and Wygant, James C., to Monsanto Company. Lubricants for rolling contact bearings. 3,925,217, Cl. 252-52.00A.

Green, Robert Leonard, to Emergency Products Corporation. Alarm signal processing system and method. 3,925,773, Cl. 340-258.00A.

Greenaway, David: *See—*
Gale, Michael Thomas; and Greenaway, David, 3,924,925.

Greenlee Brothers and Co.: *See—*
Linquist, Wayne; Pearson, Vernon W.; Hagemeyer, Kenneth; and Smeltzer, William E., 3,924,438.

Greenwood, Arthur R.; Heinze, Walter W.; Schnitta, Edward; and Andrejasich, Frank H., to Universal Oil Products Company. Ring-flanged slip-joint for a reactor system. 3,925,025, Cl. 23-288.00G.

Gregg, Michael J. W., to Goodyear Tire & Rubber Company, The. Circular side positive drive belt teeth. 3,924,481, Cl. 74-231.00C.

Gregoire Flowers, Inc.: *See—*
Gregoire, Gerald L., 3,924,354.

Gregoire, Gerald L., to Gregoire Flowers, Inc. Shipping and display carton for cut flowers. 3,924,354, Cl. 47-34.110.

Gregory, M. Duane: *See—*
Clark, Charles R.; Gregory, M. Duane; Casad, Burton M.; Krehbiel, Delmar D.; and Kennedy, Carl D., 3,924,681.

Greuter, Hans; Frater, Georg; and Schmid, Hans, to Hoffmann-La Roche Inc. Polycyclic alcohols. 3,925,486, Cl. 260-617.00F.

Greuter, Hans: *See—*
Frater, Georg; Greuter, Hans; and Schmid, Hans, 3,925,477.
Frater, Georg; Greuter, Hans; and Schmid, Hans, 3,925,479.

Grevillius, Nils Fredrik: *See—*
Carlsson, Lars Erik; Grevillius, Nils Fredrik; and Hellner, Lars Ivar, 3,925,061.

Grewe, Ferdinand: *See—*
Kuhle, Engelbert; Grewe, Ferdinand; and Kaspers, Helmut, 3,925,443.

Grey, David S. Compact seven element zoom lens with mechanical compensation. 3,924,934, Cl. 350-184.000.

Griffey, Donald E., to Quasar Electronics Corporation. Stable power supply. 3,925,716, Cl. 321-2.000.

Griffith Laboratories, Inc., The: *See—*
Reinhart, Robert R.; and Sair, Louis, 3,925,566.

Griffiths, Kenneth F. Process for manufacturing aluminum sulfate. 3,925,532, Cl. 423-132.000.

Griss, Peter: *See—*
Heimke, Gunther; Griss, Peter; and Frhr. von Andrian-Werburg, Hanns, 3,924,274.
Heimke, Gunther; Griss, Peter; and von Andrian-Werburg, Hanns Frhr., 3,924,275.

Grohe, Klaus; and Frohberger, Paul-Ernst, to Bayer Aktiengesellschaft. Certain 2-oxo-4-thiazoline-5-carboxylic acid esters. 3,925,400, Cl. 260-306.70R.

Grohmann, Klaus: *See—*
Schubert, Klaus; and Grohmann, Klaus, 3,924,816.

Groos, Richard T., to Viking Corporation, The. Valve and sprinkler head for automatic fire extinguishing systems. 3,924,687, Cl. 169-19.000.

Grossi, Oscar, to Cogne Macchine Tessili-Cognetex S.p.A. Thread suction tube connection. 3,924,395, Cl. 57-34.500.

Grot, Walther Gustav, to Du Pont de Nemours, E. I., and Company. Method of making laminates of support material and fluorinated polymer containing pendant side chains containing sulfonyl groups. 3,925,135, Cl. 156-213.000.

Grote, Herbert Edward: *See—*
Koepfle, Frank Xavier; and Grote, Herbert Edward, 3,925,230.

Grow Chemical Corporation: *See—*
Brewer, George E. F., 3,925,580.
Tsou, Ivan H., 3,925,298.

Gruber, Wolfgang: *See—*
Beaucamp, Klaus; Mollering, Hans; Lang, Gunter; Gruber, Wolfgang; and Roeschlau, Peter, 3,925,164.

Grudelbach, Hans-Dieter. Monitoring, counting and safety apparatus. 3,925,681, Cl. 307-117.000.

Gruner, Frederick R., to United States of America, Army. Lightweight cartridge case of improved aluminum alloy material which eliminates catastrophic failures. 3,924,534, Cl. 102-43.00R.

GTE Sylvania Incorporated: *See—*
Emerson, Lucian F., 3,924,903.
Headley, Geoffrey Allen, 3,925,737.

Guanella, Gustav; and Schweizer, Rudolf, to Patelhold Patentverwertungs- und Elektro-Holding AG. Digital scrambling apparatus for use in pulsed signal transmission. 3,925,612, Cl. 178-22.000.

Guarino, Michael C.; and Cacossa, Frank, to M. C. Guarino Associates, Inc. Adjustable modular partition system. 3,924,369, Cl. 52-122.000.

Guidotti, Ronald A., to United States of America, Interior. Preparation of alloys. 3,925,068, Cl. 75-174.000.

Guion, Jacky: *See—*
Riess, Jean G.; Le Blanc, Maurice; Santini, Georges; and Guion, Jacky, 3,925,491.

Gulbis, Imants; and Jordan, Rodney W., to United States of America, Army. Portable fluoroscope. 3,925,675, Cl. 250-485.000.

Gulf Research & Development Company: *See—*
Juvkam-Wold, Hans C., 3,924,698.

Gulf & Western Manufacturing Company (Systems): *See—*
Solomon, Elias E., 3,925,687.

Gunnarsson Ek, Klas Goran: *See—*
Horlin, Dick Axel; and Gunnarsson Ek, Klas Goran, 3,924,696.

Gurtler, Peter, to Ciba-Geigy AG. Disperse dye concentrate with sawdust. 3,925,007, Cl. 8-91.000.

Gurtner, S.A.: *See—*
Iung, Jacques, 3,925,048.

Gut, Vladimir: *See—*
Coupek, Jiri; and Gut, Vladimir, 3,925,267.

Gutehoffnungshutte Sterkrade Aktiengesellschaft: *See—*
Hutgens, Jochen; and Adomat, Gunter, 3,925,042.

H. C. Price Co.: *See—*
Harris, Robert J.; and Lee, Irvin J., 3,924,562.

H. L. Bouton, Company: *See—*
Hirschmann, Jack B., Jr., 3,924,271.

H. W. Crane Company: *See—*
Fox, Edward I., 3,924,301.
Fox, Edward I., 3,924,488.

Haake, Inc.: *See—*
Ossman, John W., Jr., 3,924,459.

Haarmann & Reimer GmbH: *See—*
Eicher, Theo; Muller, Friedemann; and Krebs, Klaus-Werner, 3,924,642.

Haas, James Lynn, to Owens-Corning Fiberglas Corporation. Method of making an integral skin foamed product wherein portions of the skin are of greater densities. 3,925,526, Cl. 264-45.500.

Haas, Jorg, to Bruker-Physik AG. Recorder with cutting mechanism. 3,925,786, Cl. 346-24.000.

Haase, Jaroslav, to Ciba-Geigy AG. Polyarcrylonitrile basic dyeing process with anionic assistant. 3,925,016, Cl. 8-169.000.

Haberle, Wilhelm. Molding apparatus including conically-shaped compacting member. 3,925,000, Cl. 425-422.000.

Habermeier, Jurgen: *See—*
Porret, Daniel; and Habermeier, Jurgen, 3,925,406.

Hachmann, Klaus; Saran, Herbert; and Sperling, Gerhard, to Henkel & Cie G.m.b.H. Coated bleach activator. 3,925,234, Cl. 252-186.000.

Hackman, Frank C.: *See—*
Leopold, Wilbur R., Jr.; Hackman, Frank C.; Luckenbill, Lawrence F.; and Ellis, Daniel A., 3,924,877.

Hadnagy, Thomas D.: *See—*
Rauch, Marvin A.; Boni, Raymond L.; and Hadnagy, Thomas D., 3,924,332.

Haeusler, Jochen, to Siemens Aktiengesellschaft. Electronic computer for the static recognition of the divisibility, and the division of, numbers divisible by three, six and nine. 3,925,649, Cl. 235-159.000.

Hafner, Otto P. Interlocking joint for overlying sheet material. 3,924,378, Cl. 52-758.00D.

Hagemeyer, Kenneth: *See—*
Linquist, Wayne; Pearson, Vernon W.; Hagemeyer, Kenneth; and Smeltzer, William E., 3,924,438.

Hager, Frans C. L.: *See—*
Hager, Richard W. F.; and Hager, Frans C. L., 3,925,079.

Hager, Lowell T. Positive crankcase ventilation system. 3,924,588, Cl. 123-119.00B.

Hager, Richard W. F.; and Hager, Frans C. L. Decorative article and method of making same. 3,925,079, Cl. 96-38.100.

Haggart, James A., Jr.: *See—*
Bray, Martin L.; Cole, Edward N.; and Haggart, James A., Jr., 3,925,026.

Haggren, Erik, to Morgardshammar AB. Gyratory crusher. 3,924,815, Cl. 241-209.000.

Hagiwara, Yoshitoshi: *See—*
Osawa, Makoto; Hagiwara, Yoshitoshi; Kusaka, Kunio; Kawakita, Takao; Motoyoshi, Kenya; and Kuroishi, Nobuhito, 3,925,065.

Haile, Paul C.; and Sellgren, Arthur O. Knife sharpener. 3,924,360, Cl. 51-221.0BS.

Haines, Russell R., to Paco Packaging, Inc. Childproof package. 3,924,746, Cl. 206-530.000.

Haitz, Roland H.; Sedlewicz, Paul G.; Stirrup, Keith A.; Hilbiber, David F.; and Teichner, Robert W., to Hewlett-Packard Company. Photon isolator with improved photodetector transistor stage. 3,925,801, Cl. 357-19.000.

Hajos, Zoltan George, to Hoffmann-La Roche Inc. Stereospecific total steroidal synthesis via substituted C/D-trans indanones. 3,925,478, Cl. 260-586.00F.

Hakim, Salomon. Ventricular shunt having a variable pressure valve. 3,924,635, Cl. 128-350.00V.

Halifax Tool Company Limited: *See—*
Shaw, Alan, 3,924,690.

Halko, Richard A.: *See—*
Moreau, James O.; and Halko, Richard A., 3,924,449.

Hamada, Hideo: *See—*
Ookubo, Takashi; and Hamada, Hideo, 3,924,717.

Hamada, Kenji, to Alps Electric Co., Ltd. Chattering immune circuit. 3,925,682, Cl. 307-134.000.

Hamamura, Yoshitaro, to Daiichi Rubber Co., Ltd. Water-tight fastener. 3,924,305, Cl. 24-205.10R.

Hamisch, Paul H., Sr.: *See—*
Bussard, Charles B.; Hamisch, Paul H., Sr.; and Wisecup, David R., 3,924,523.

Hamish, Small; and Stevens, Timothy S., to Dow Chemical Company, The. Chromatographic analysis of ionic species. 3,925,019, Cl. 23-230.00R.

Hammond Corporation: *See—*
Schrecongost, Ray B., 3,924,505.

Hammond, William D., to L & R Industries, Inc. Air gun mechanism arrangement including trigger safety. 3,924,599, Cl. 124-15.000.

Hamprecht, Gerhard: *See—*
Fischer, Adolf; Hamprecht, Gerhard; Mangold, Dietrich; and Rohr, Wolfgang, 3,925,439.

Hampton, Richard John; Rolland, Jacques Robert; and Gallo, Thomas, to Ogilvie Flour Mills Company Limited. Readily dispersible dry gluten product and uses thereof. 3,925,343, Cl. 260-112.00G.

Hamsher, James J., to Pfizer Inc. Immobilized enzymes. 3,925,157, Cl. 195-63.000.

Handa, Minoru: *See—*
Tanaka, Hideki; Watanabe, Mikio; Handa, Minoru; Inouchi, Mitsuhiro; Yoshioka, Shigeru; and Ishida, Kazutaka, 3,925,732.

Hannemann, Ludwig; and Simon, Manfred Horst, to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft. Package construction, particularly a package designed for a single use. 3,924,745, Cl. 206-484.000.

Hans Sickinger Co.: *See—*
Pfaffle, Ernst, 3,924,664.

Hansen, James G.: *See—*
Andrus, Edward R., Jr.; Fahnstrom, Dale E.; Hansen, James G.; and Nichols, Charles E., 3,924,309.

Hanser, Paul Edmund; and Snyder, William Lee, to Deere & Company. Direction control valve having float mode. 3,924,656, Cl. 137-596.140.

Hanson, Violet M.; and Finn, John E., to Violet M. Hanson. Method for forming flat bottom plastic bags. 3,924,521, Cl. 93-35.0SB.

Harada, Tsutomu: *See—*
Takamura, Akio; and Harada, Tsutomu, 3,924,467.

Harbert, Charles A.: *See—*
Welch, Willard M., Jr.; and Harbert, Charles A., 3,925,409.

Harboe, Henrik. Combustion chamber for gas turbines and the like having a fluidized burner bed. 3,924,402, Cl. 60-39.18C.

Hardinge Brothers, Inc.: *See—*
Parsons, Hubert J.; and Peterson, Anders Adolf, 3,924,514.

Hargreaves, James Roger: *See—*
Harris, Arthur; Burrows, John; and Hargreaves, James Roger, 3,925,245.

Harke, Cyril J.: *See—*
Eng, Jeffrey D.; and Harke, Cyril J., 3,925,174.

Harner, Kermit I.; Hixson, William W.; Spadafora, Michael A.; and Stearns, Charles F., to United Technologies Corporation. Compressor bleed sensor and control for turbine type power plants. 3,924,960, Cl. 415-28.000.

Haromy, Fred: *See—*
Franceschina, Louis E.; Haromy, Fred; and Kruppert, Frederick W., 3,924,435.

Harper, Ernest A., to Phillips Petroleum Company. Removal of moisture from a natural gas stream by contacting with a liquid desiccant-antifreeze agent and subsequently chilling. 3,925,047, Cl. 62-20.000.

Harra, David J., to Varian Associates. Sublimation vacuum pump having a removable gas permeable condenser. 3,924,967, Cl. 417-51.000.

Harris, Ailan; and Huff, Lemuel Hampton, to Johns-Manville Corporation. Bell end of bell and spigot joint and method and assembly. 3,924,999, Cl. 425-392.000.

Harris, Arthur; Burrows, John; and Hargreaves, James Roger, to Ciba-Geigy Corporation. Corrosion inhibiting composition containing an aminoalkyl-phosphonic acid and an inorganic nitrite. 3,925,245, Cl. 252-389.00A.

Harris Corporation: *See—*
Cook, Koy B., Jr.; Davidson, Jimmy L.; Gibson, Joseph D.; and Patterson, Raymond B., III, 3,924,321.

Harris-Intertype Corporation: *See—*
Reed, David A., 3,924,846.
Wise, James C.; and Fernandez-Rana, Victoriano, 3,924,845.

Harris, Janet E. Measuring device. 3,924,472, Cl. 73-426.000.

Harris, John L., to Deltrol Corporation. Timer switch assembly having latch assembly for preventing contact engagement. 3,925,630, Cl. 200-39.00R.

Harris, Robert J.; and Lee, Irvin J., to H. C. Price Co. Apparatus for coating pipe. 3,924,562, Cl. 118-320.000.

Harsco Corporation: *See—*
Hutchinson, Leigh, 3,924,379.
Shohet, Albert J., 3,924,710.

Hart, Joseph J.: *See—*
Desmond, John D.; and Hart, Joseph J., 3,924,800.

Hartkopf, Heinz, to Th. Kieserling & Albrecht. Machine for straightening elongated objects. 3,924,431, Cl. 72-98.000.

Hartley, Joseph H.: *See—*
Bates, Calvin D.; and Hartley, Joseph H., 3,925,738.

Hartmann & Braun Aktiengesellschaft: *See—*
Staab, Joachim, 3,925,667.

Hasegawa, Akira: *See—*
Ide, Fumio; Kishida, Kazuo; and Hasegawa, Akira, 3,925,510.

Hashimoto, Joji: *See—*
Doi, Yasushi; Shoda, Mikio; Oguri, Masatoshi; and Hashimoto, Joji, 3,925,602.

Hashizume, Toshio: *See—*
Takechi, Hiroshi; Kawano, Tsuyoshi; Hashizume, Toshio; Koyama, Kazuo; and Masui, Hiroaki, 3,925,111.

Hata, Shigeki, to Kanto Seiki Co., Ltd. Tire pressure alarm equipment. 3,925,755, Cl. 340-58.000.

Hatherly, David G. Production of chlorine dioxide. 3,925,540, Cl. 423-478.000.

Hatz, Ernst; and Schmuck, Johann, to Motorenfabrik Hatz KG. Internal combustion engine having a sound-muffling casing. 3,924,597, Cl. 123-198.00E.

Hauber, Charles Elwood, to Singer Company, The. Rotary data base converter with flexible data base. 3,925,607, Cl. 178-7.100.

Haug, Theobald: *See—*
Renner, Alfred; and Haug, Theobald, 3,925,314.

Hauni-Werke Korber & Co., KG: *See—*
Krause, Lothar, 3,925,131.

Hausch, Walter R.; Fieldhouse, John W.; and Kay, Edward L., to Firestone Tire & Rubber Company The. Laminate with an adhesive including an N-nitroso compound. 3,925,590, Cl. 428-423.000.

Hausweiler, Arnold; Paris, Nikolaus; and Ennenbach, Karl-Heinz, to Erdolchemie Gesellschaft mit beschrankter Haftung. Process for preparing an iron containing catalyst. 3,925,250, Cl. 252-437.000.

Hautala, Earl: *See—*
Randall, John M.; Hautala, Earl; Waiss, Anthony C., Jr.; and Kuhnle, Judith A., 3,925,192.

Hawkins, Ronald G., to Aluminum Company of America. Frameless damping spacer. 3,925,595, Cl. 174-42.000.

Hayashi, Yoshimasa: *See—*
Yoshida, Eiji; and Hayashi, Yoshimasa, 3,925,091.

Head, James L. Cellular cement composition. 3,925,090, Cl. 106-87.000.

Headley, Geoffrey Allen, to GTE Sylvania Incorporated. Signal coupling apparatus. 3,925,737, Cl. 333-6.000.

Hebert, Arthur J. Scale tester. 3,924,443, Cl. 73-1.00B.

Hegar, Gert: *See—*
Wohlkonig, Alexander; Hindermann, Peter; Beffa, Fabio; and Hegar, Gert, 3,925,348.

Hegarty, Brian Anthony: *See—*
Trevail, Lewis Herbert; and Hegarty, Brian Anthony, 3,924,323.

Heger, Donald A. Method for making a plastic bag. 3,924,383, Cl. 53-14.000.

Heggen, John P., to Clark Equipment Company. Tractor vehicle having material handling subframe. 3,924,702, Cl. 180-6.480.

Hegler, Wilhelm. Apparatus for manufacture of partitioned plastic tubing. 3,924,992, Cl. 425-233.000.

Heiba, EL-Ahmadi Ibrahim; and Williams, Albert Lloyd, to Mobil Oil Corporation. Hydroxyamide acid products and butyrolactone and butyrolactam products. 3,925,232, Cl. 252-171.000.

Heiberger, Charles A., to Air Products and Chemicals, Inc. Post chlorinated vinyl chloride copolymers. 3,925,337, Cl. 260-87.50C.

Heidorn, John Henry, to General Motors Corporation. Vehicle air conditioning control. 3,924,417, Cl. 62-158.000.

Heiler, Wolfgang; Muller, Rudolf; and Becker, Jean-Jacques. Automatic guide device for sewing machine or machine for assembling two or more superposed elements. 3,924,551, Cl. 112-153.000.

Heilman, Gerald D.; Paddock, Gordon R.; and Ranft, Ernst L., to General Motors Corporation. Engine secondary air flow control valve. 3,924,409, Cl. 60-290.000.

Heim, Egon. Torsion pendulum clock. 3,924,401, Cl. 58-152.00R.

Heimann, Egon. Index tab sheet. 3,924,744, Cl. 206-460.000.

Heimberger, Werner: *See—*
Geiger, Friedhelm; Heimberger, Werner; Schreyer, Gerd; and Weigert, Wolfgang, 3,925,377.

Heimke, Gunther; Griss, Peter; and Frhr. von Andrian-Werburg, Hanns, to Friedrichsfeld GmbH Steinzeug-und Kunststoffwerke. An adjunct and method for facilitating implantation of joint prostheses. 3,924,274, Cl. 3-1.910.

Heimke, Gunther; Griss, Peter; and von Andrian-Werburg, Hanns Frhr., to Friedrichsfeld GmbH Steinzeug-und Kunststoffwerke. Artifical joint prosthesis using Al_2O_3 material. 3,924,275, Cl. 3-1.912.

Heimsch, Robert A.; and Reaville, Eric T., to Monsanto Company. Light sensitive compositions and products. 3,925,076, Cl. 96-35.100.

Heimsch, Robert Arthur; and Mottus, Edward Hugo, to Monsanto Company. Organoaluminum process for imide-alcohol condensation. 3,925,325, Cl. 260-78.00L.

Heineken Technisch Beheer B.V.: *See—*
Gravesteijn, Elbert, 3,924,739.

Heinrich, Bernhard; Naarmann, Herbert; and Thoma, Peter, to BASF Aktiengesellschaft. Production of polymers in powdered form which contain carboxylic acid or carboxylic anhydride groups. 3,925,329, Cl. 260-78.50R.

Heinze, Walter W.: *See—*
Greenwood, Arthur R.; Heinze, Walter W.; Schnitta, Edward; and Andrejasich, Frank H., 3,925,025.

Heitlinger, Louis J.; Bahr, John P.; Smith, John H.; and Anderson, Thomas W., to General Electric Company. Patient monitoring and data processing system. 3,925,762, Cl. 340-150.000.

Heitsch, Charles W., to Monsanto Company. 1,5-Dioxo-2,4,6,8,9,11-hexakis (methylimida)-1,5-diphosphabicyclo[3,3,3]undecane. 3,925,467, Cl. 260-551.00P.

Heller, Harold: *See—*
Corte, Herbert; Heller, Harold; and Netz, Otto, 3,925,264.

Heller, William C., Jr.: *See—*
Leatherman, Alfred F.; and Shatzkin, Leonard, 3,925,126.

Hellner, Lars Ivar: *See—*
Carlsson, Lars Erik; Grevillius, Nils Fredrik; and Hellner, Lars Ivar, 3,925,061.

Henderson, Larry D.: *See—*
Cox, Charles D.; Johnson, Craig E.; and Henderson, Larry D., 3,925,125.

Hendrix, Palmer G., to Hill and Griffith Company, The. Bituminous coating system and articles produced thereby. 3,925,576, Cl. 427-230.000.

Henkel & Cie G.m.b.H.: *See—*
Hachmann, Klaus; Saran, Herbert; and Sperling, Gerhard, 3,925,234.
Ploger, Walter; Schmidt-Dunker, Manfred; and Gloxhuber, Christian, 3,925,456.

Henkin, Robert I.; and Giroux, Eugene L., to United States of America, Health, Education and Welfare. Isolation and purification of active principle of fruit of synsepalum dulcificum. 3,925,547, Cl. 424-195.000.

Hennenberger, Peter: *See—*
Mueller-Tamm, Heinz; Schick, Hannes; Rau, Wolfgang; and Hennenberger, Peter, 3,925,341.

Henrick, Clive A.; and Staal, Gerardus B., to Zoecon Corporation. Esters of cyclopropane substituted carboxylic acids. 3,925,460, Cl. 260-468.00H.

Henrick, Clive A.; and Staal, Gerardus B., to Zoecon Corporation. Esters of cyclopropane alkanoic acids. 3,925,461, Cl. 260-468.00H.

Heraeus-Schott Quarzschmelze GmbH: *See—*
Rau, Karlheinz; and Seiler, Karl, 3,925,583.

Hercules Chemical Co., Inc.: *See—*
Petersen, Arthur, Sr.; Mackowiak, Leonard S.; and Schoenholz, Daniel, 3,925,112.

Hercules Incorporated: *See—*
Boardman, Harold; Breslow, David S.; Simpson, David A.; and Wagner, Richard L., 3,924,520.

Heredy, Laszlo A.: *See—*
Saunders, Richard C.; and Heredy, Laszlo A., 3,925,098.

Herron, David K.: *See—*
Cooper, Robin D. G.; and Herron, David K., 3,925,368.

Herstel, Henk; and van den Ouweland, Godefridus Antonius Maria, to Lever Brothers Company. Method for imparting color to texturized vegetable protein. 3,925,561, Cl. 426-250.000.

Hess, Johann; Paule, Kurt; Latzina, Kurt; and Wolf, Richard, to Robert Bosch G.m.b.H. Pneumatic torqueing tool. 3,924,961, Cl. 415-32.000.

Hess, Stanley R., to Cordis Corporation. Cardiac pacer lead system for interim pacing during pacer changeover. 3,924,639, Cl. 128-418.000.

Hesse, Jurgen: *See—*
Schmidt, Jurgen; and Hesse, Jurgen, 3,924,357.

Hester, Gerald, to MSI Data Corporation. Method and apparatus for reading bar coded data wherein a light source is periodically energized. 3,925,639, Cl. 235-61.11E.

Heurtaux, Simone; and Costerousse, Germain, to Roussel Uclaf. Novel salts of vincanol. 3,925,393, Cl. 260-293.530.

Hewlett-Packard Company: *See—*
Haitz, Roland H.; Sedlewicz, Paul G.; Stirrup, Keith A.; Hilbiber, David F.; and Teichner, Robert W., 3,925,801.

Heyman, Joseph S.; and Miller, James G., to United States of America, General Counsel-Code GP. Ultrasonic calibration device. 3,924,444, Cl. 73-1.00R.

Hiatt, Norman A.; Wolf, Harold G.; and Hlavacek, Robert A., to Uniroyal, Inc. Light-stable thermoplastic polyurethanes. 3,925,319, Cl. 260-75.0NT.

Hickey, Thomas Nelson; and Spulgis, Ivars Sigurds, to CVI Corporation. Radioactive gas standby treatment apparatus with high efficiency rechargeable charcoal filter. 3,925,046, Cl. 55-387.000.

Higuchi, Takeshi: *See—*
Toyama, Seiji; Yoshikawa, Kazuo; and Higuchi, Takeshi, 3,925,813.

Hilary Page "Sensible" Toys Limited: *See—*
Taylor, Christine; and Chisnall, David William, 3,924,348.

Hilbiber, David F.: *See—*
Haitz, Roland H.; Sedlewicz, Paul G.; Stirrup, Keith A.; Hilbiber, David F.; and Teichner, Robert W., 3,925,801.

Hildebrand, Bernard P.: *See—*
Richardson, Richard L.; Hildebrand, Bernard P.; and Mahan, Robert E., 3,925,646.

Hildebrand, Dietrich: *See—*
Ringel, Paul; Hildebrand, Dietrich; and Breidbach, Gunter, 3,925,012.

Hilger, Edwin T.; and Miller, James S., to A-T-O, Inc. Shuttel car mechanism for transferring loads between two stations. 3,924,300, Cl. 214-16.40A.

Hill Acme Company, The: *See—*
Kurtz, Albert L., 3,924,504.

Hill, Forrest G., to Marsh Stencil Machine Company. Repeater tape machine. 3,924,498, Cl. 83-58.000.

Hill and Griffith Company, The: *See—*
Hendrix, Palmer G., 3,925,576.

Hiller, John Barry; Richards, John Alan; and Huey, Richard Meredyth, to Unisearch Limited. Extended monopole spectrometers and filters. 3,925,663, Cl. 250-292.000.

Hilliard, John Joseph: *See—*
Chaires, Anne Marie; Ciconte, Jean Marie; Ett, Allen Harold; Hilliard, John Joseph; and Rosenbaum, Walter Steven, 3,925,761.

Hills, Geoffrey Dean Loftus: *See—*
Scott, Trevor William; and Hills, Geoffrey Dean Loftus, 3,925,560.

Himuro, Masami: *See—*
Naruse, Yosuke; Yoshioka, Taisuke; Himuro, Masami; and Ito, Keiichi, 3,925,603.

Hinata, Masanao: *See—*
Sato, Akira; Shiba, Keisuke; and Hinata, Masanao, 3,925,084.

Hinato, Masanao: *See—*
Sato, Akira; Ogawa, Akira; Shiba, Keisuke; and Hinato, Masanao, 3,925,085.

Hinckley, John N. Engine. 3,924,976, Cl. 418-8.000.

Hindermann, Peter: *See—*
Wohlkonig, Alexander; Hindermann, Peter; Beffa, Fabio; and Hegar, Gert, 3,925,348.

Hinson, David C.: *See—*
Fein, Michael E.; and Hinson, David C., 3,925,697.

Hippel, Ludwig Jakob; and Pemsl, Alex, to Upjohn Company, The. Metering or injection element. 3,924,651, Cl. 137-115.000.

Hirata, Arthur Atsunobu, to Abbott Laboratories. Method of coating stabilized erythrocytes. 3,925,541, Cl. 424-12.000.

Hirmann, Georg, to Repapress AG. Tool. 3,924,843, Cl. 269-20.000.

Hirohashi, Toshiyuki: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,925,364.

Hirokawa, Kyoichi: *See—*
Mitsuhashi, Shigeru; Hirokawa, Kyoichi; Saito, Noboru; Kaneko, Minoru; Shoji, Michihiro; Kowada, Masunari; and Kazama, Yasuo, 3,924,330.

Hirose, Ryusho, to Canon Kabushiki Kaisha. Anamorphotic lens system. 3,924,933, Cl. 350-181.000.

Hirose, Yoshio: *See—*
Enei, Hitoshi; Matsui, Hiroshi; and Hirose, Yoshio, 3,925,154.

Hirs, Gene, to Hydromation Filter Company. Method of and apparatus for filtering water. 3,925,202, Cl. 210-32.000.

Hirschmann, Jack B., Jr., to H. L. Bouton, Company. Goggles. 3,924,271, Cl. 2-14.00D.

Hiruta, Makoto: *See—*
Musashi, Akira; Yamazaki, Masami; and Hiruta, Makoto, 3,925,275.

Hitachi, Ltd.: *See—*
Fukuhara, Akira, 3,924,924.
Honkawa, Tadashi; and Fukuda, Kenji, 3,924,949.
Hosho, Yukio; Oyama, Yoshishige; and Karino, Kimiji, 3,924,407.
Nakano, Yasuaki, 3,925,615.
Nomiya, Kosei, 3,925,686.
Nomura, Setsuo; Komoda, Tsutomu; and Nakaizumi, Yasushi, 3,925,706.
Otani, Tadahiko, 3,925,521.

Saida, Hiroji; Ono, Yuichi; Nomura, Masayoshi; Tamura, Masao; and Kozuka, Hirotsugu, 3,925,120.
Waniishi, Kenji; and Ninomiya, Koichiro, 3,924,838.
Hitachi Shipbuilding and Engineering Co. Ltd.: *See*—
Uchiyama, Tomoyoshi; Sekino, Susumu; and Tani, Kenji, 3,924,450.
Hitzelberger, David A.: *See*—
Buller, Joseph S.; Eneim, Arthur A.; and Hitzelberger, David A., 3,924,654.
Hixson, William W.: *See*—
Harner, Kermit I.; Hixson, William W.; Spadafora, Michael A.; and Stearns, Charles F., 3,924,960.
Hjelmquist, Stig Gunnar. Arrangement in table games. 3,924,854, Cl. 273-85.00B.
Hlavacek, Robert A.: *See*—
Hiatt, Norman A.; Wolf, Harold G.; and Hlavacek, Robert A., 3,925,319.
Hobbs, Charles W.: *See*—
Li, Tao P.; and Hobbs, Charles W., 3,925,255.
Hobbs, James: *See*—
Gilbert, Glen A.; and Hobbs, James, 3,925,750.
Hodge, Edward B., to Commercial Solvents Corporation. Resorcyclic acid lactones and their production. 3,925,423, Cl. 260-343.20F.
Hodge, James Dwight, to Du Pont de Nemours, E. I., and Company. Hollow filament spinneret. 3,924,988, Cl. 425-461.000.
Hodgson, Clive, to Chevron Research Company. Hydroxy-aluminum nitrate polymer production. 3,925,428, Cl. 423-394.000.
Hoechst Aktiengesellschaft: *See*—
Bock, Hartmut, 3,924,462.
Brecht, Heinz; and Hoffmann, Dieter, 3,925,438.
Bumberger, Dietrich, 3,924,911.
Katsimbas, Themistoklis, 3,925,507.
Meininger, Fritz; Hoyer, Ernst; and Fuchs, Hermann, 3,925,351.
Papenfuss, Theodor; Rehberg, Rolf; and Spietschka, Ernst, 3,925,094.
Sextro, Gunter; and Burg, Karlheinz, 3,925,505.
Hoehn, Hans; and Denzel, Theodor, to E. R. Squibb & Sons, Inc. 4-Piperazino-[3,4-b]pyridine-5-carboxylic acids and esters. 3,925,388, Cl. 260-268.0BC.
Hoffmann, Dieter: *See*—
Brecht, Heinz; and Hoffmann, Dieter, 3,925,438.
Hoffmann, Friedrich; and von Kamp, Wilhelm, to Daimler-Benz Aktiengesellschaft. Partial lining disk brake. 3,924,711, Cl. 188-73.300.
Hoffmann-La Roche Inc.: *See*—
Bergman, Steven C.; Gnirrep, Thomas B.; and Nazzaro, Charles A., 3,925,644.
Boller, Arthur; and Scherrer, Hanspeter, 3,925,444.
Cekoric, Thomas, Jr.; and Yananton, Patrick Michael, 3,925,163.
Cohen, Noal; Rosenberger, Michael; and Saucy, Gabriel, 3,925,420.
Fitton, Peter; and Whitesides, Thomas, 3,925,249.
Frater, Georg; Greuter, Hans; and Schmid, Hans, 3,925,477.
Frater, Georg; Greuter, Hans; and Schmid, Hans, 3,925,479.
Greuter, Hans; Frater, Georg; and Schmid, Hans, 3,925,486.
Hajos, Zoltan George, 3,925,478.
Metlesics, Werner; and Sternbach, Leo Henryk, 3,925,359.
Ning, Robert Ye-Fong; and Schwartz, Morton A., 3,925,358.
Hofstein, Steven R., to Princeton Electronic Products, Inc. Method and apparatus for improving the readout characteristics of electronic storage tubes. 3,925,702, Cl. 315-12.000.
Hogg, Walter R., to Coulter Electronics, Inc. Apparatus for preservation and identification of particles analyzed by flow-through apparatus. 3,924,947, Cl. 356-39.000.
Hohnfeld, Peter; and Langenberg, Hartmut, to Dierks & Soehne. Mixer for particulate materials. 3,924,835, Cl. 259-6.000.
Hollan, Laszlo, to U.S. Philips Corporation. Method of depositing layers which mutually differ in composition onto a substrate. 3,925,118, Cl. 148-175.000.
Hollingsworth, Clinton Allen; and Snyder, John Harold, to Borden, Inc. Grid burner system. 3,925,024, Cl. 23-277.00R.
Holman, Frank Brouwer, to Chirico, Lorraine; and Fulcher, John R., part interest to each. Animal caging system. 3,924,571, Cl. 119-15.000.
Holmen, Reynold E.; and Nellessen, Alfred H., to Minnesota Mining and Manufacturing Company. Retro-reflective sheet material. 3,924,929, Cl. 350-103.000.
Holmes, David Alan, to Du Pont de Nemours, E. I., and Company. Polytetrafluoroethylene aqueous dispersions which provide coatings of improved gloss. 3,925,292, Cl. 260-29.60F.
Holt, William David, to Lucas Electrical Company Limited. Direction indicator control circuit. 3,925,758, Cl. 340-73.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Miyaki, Kiyoshi; and Kogure, Hiroshi, 3,924,590.
Miyaki, Kiyoshi; and Kogure, Hiroshi, 3,924,592.
Nakano, Soichi; and Iizuka, Yoshitoku, 3,924,863.
Osawa, Makoto; Hagiwara, Yoshitoshi; Kusaka, Kunio; Kawakita, Takao; Motoyoshi, Kenya; and Kuroishi, Nobuhito, 3,925,065.
Yagi, Shizuo; Miyaki, Kiyoshi; and Kogure, Hiroshi, 3,924,582.
Honeywell Inc.: *See*—
Kardashian, Vahram S., 3,925,593.
Medlar, Lewis A., 3,924,466.
Honeywell Information Systems Inc.: *See*—
Louie, Ming H., 3,925,647.
Miller, Homer W., 3,925,651.
Miller, Homer W., 3,925,652.
Honeywell Information Systems Italia: *See*—
Bardotti, Angelo; and Pederzini, Renzo, 3,925,766.
Honkawa, Tadashi; and Fukuda, Kenji, to Hitachi, Ltd. Spectrophotometer for use as a split beam and dual wavelength measurements. 3,924,949, Cl. 356-73.000.
Hoofnagle, Frank M., to BWB Controls, Inc. Crane boom and line safety limit warning assembly. 3,924,752, Cl. 212-39.0MS.
Hooker Chemicals & Plastics Corporation: *See*—
Eng, Jeffrey D.; and Harke, Cyril J., 3,925,174.
Lin, Kingso Chingtsung, 3,925,265.
Stone, Jonathan A.; and Bluemle, Albert W., 3,925,296.
Hoover Company, The: *See*—
Tschudy, Donald B.; and Fawcett, John L., 3,924,291.
Hoover, John R. E.: *See*—
De Marinis, Robert M.; and Hoover, John R. E., 3,925,373.
Horii, Hideo; Kaiya, Atsushi; and Otsuki, Yutaka, to Nippon Oil Company Ltd. Cold setting coating compositions. 3,925,279, Cl. 260-22.0CB.
Horizons Incorporated: *See*—
Lewis, James M.; and Newyear, Raymond W., 3,925,077.
Horlacher, Paul: *See*—
Tscharner, Christopher Johannes; Schwarz, Maurice Jacob; and Horlacher, Paul, 3,925,260.
Horlin, Dick Axel; and Gunnarsson Ek, Klas Goran, to Atlas Copco Aktiebolag. Method and device for dust collecting air-flushed rock drilling. 3,924,696, Cl. 175-209.000.
Horn, Peter: *See*—
Schlichting, Karl; Horn, Peter; Schlag, Johannes; and Koernig, Wolfgang, 3,925,306.
Horrom, Bruce Wayne, to Abbott Laboratories. N-vinyl oxyethyl-α-methyl-β-phenethylamines. 3,925,475, Cl. 260-570.80R.
Horst, Patricia J. Retainer for a separated tear tab on a can. 3,924,776, Cl. 220-269.000.
Hortig, Wilhelm, to K.M. Engineering Aktiengesellschaft at Herrengrabenweg. Process for the non-cutting production of sheet steel containers. 3,924,437, Cl. 72-349.000.
Hortlik, Frantisek: *See*—
Esser, Miroslav; Ledr, Zdenek; Ferkl, Frantisek; Kubovy, Miloslav; Ripka, Josef; Hortlik, Frantisek; and Elias, Jiri, 3,924,398.
Horzepa, John P.; and Swanson, David B., to Engelhard Minerals & Chemicals Corporation. Sulfur recovery catalyst and production thereof from bauxite ore. 3,925,257, Cl. 252-463.000.
Hosho, Yukio; Oyama, Yoshishige; and Karino, Kimiji, to Hitachi, Ltd. Exhaust emission control device. 3,924,407, Cl. 60-284.000.
Hosoda, Yoshikado: *See*—
Matsui, Kazumi; Umemori, Takashi; Matsuura, Kenji; Hosoda, Yoshikado; Nishikawa, Tadashige; and Tawara, Makoto, 3,924,537.
Hosokawa, Kenjiro: *See*—
Makino, Syoso; Hosokawa, Kenjiro; and Sano, Junzi, 3,925,008.
Hostetler, Dewey L. Hydraulic side lift loader. 3,924,765, Cl. 214-518.000.
Houben, Mathijs Maria Hendrikus, to U.S. Philips Corporation. Method of manufacturing a mixture for TV glasses. 3,925,089, Cl. 106-53.000.
Houlihan, William J.; and Nadelson, Jeffrey, to Sandoz, Inc. 10-(2-Dialkylaminoethyl)-10,11-dihydro, or 10-(2-dialkylaminoethyl)-5-methylene-2,7-substituted or unsubstituted-5H-dibenzo[a,d]cycloheptenes. 3,925,476, Cl. 260-570.8TC.
Houston, Stanley M. Sealing device and method of fabrication thereof. 3,924,862, Cl. 277-231.000.
Howard, Donald E. Rotary internal combustion engine. 3,924,578, Cl. 123-8.130.
Howard, Robert G.; and Zivi, Edwin L., Jr., to United States of America, Navy. Pressure drop polymer concentration meter (pcm). 3,924,448, Cl. 73-55.000.
Hoyer, Ernst: *See*—
Meininger, Fritz; Hoyer, Ernst; and Fuchs, Hermann, 3,925,351.
Hristov, Hristo Petkov: *See*—
Popov, Encho Nikolov; Diakov, Nikola Ganev; Dobreva-Dimitrova, Emilia; Apostolov, Roumen Konstantinov; and Hristov, Hristo Petkov, 3,925,696.
Hsieh, Henry, to Phillips Petroleum Company. Alkene oxide or acrylate polymerization or copolymerization catalyzed by organoaluminum-organophosphine-metal salt of a beta-diketone. 3,925,317, Cl. 260-63.00R.
Hsu, John P. T. Cartesian toy. 3,924,350, Cl. 46-92.000.
Huang, Wann-Sheng: *See*—
Wu, Ching H.; Brown, Alfred; Huang, Wann-Sheng; and Shum, Yick-Mow, 3,924,682.
Hubbard, David W.; and Coville, William W., to Pitney-Bowes, Inc. Method for printing on labels. 3,924,532, Cl. 101-426.000.
Huey, Richard Meredyth: *See*—
Hiller, John Barry; Richards, John Alan; and Huey, Richard Meredyth, 3,925,663.
Huff, Lemuel Hampton: *See*—
Harris, Allan; and Huff, Lemuel Hampton, 3,924,999.
Hughes Aircraft Company: *See*—
Basiulis, Algerd, 3,924,674.
Berwin, Ted W.; and Wilbur, Everett T., 3,925,765.
Buller, Joseph S.; Eneim, Arthur A.; and Hitzelberger, David A., 3,924,654.
Dewhirst, Donald R.; and Muir, Alexander R., 3,924,930.
Erb, Darrell M., 3,925,805.
Gaskill, James R., Jr.; and Devendorf, Don C., 3,925,684.
Gaskill, James R., Jr.; and Devendorf, Don C., 3,925,691.

Kimura, Hiroshi, 3,925,147.
Venable, H. Dean, 3,925,715.

Hughes, James W.: *See—*
Sample, Thomas E., Jr.; Hughes, James W.; and Tate, Jack F., 3,925,582.

Hughey and Phillips, Inc.: *See—*
Camic, Donald L., 3,925,704.

Hukuba, Hiroshi, to Kabushiki Kaisha Hukuba Future Research. Floor sweeper. 3,924,285, Cl. 15-49.00R.

Hulett, James S.; and Shestag, Lowell N., to Emerson Electric Co. Digital modulation generator with cylindrical antenna array system. 3,925,781, Cl. 343-106.00R.

Hummel, Merritt J., to PPG Industries, Inc. Method of improving quality of flat glass formed on molten tin. 3,925,052, Cl. 65-65.00A.

Hundertmark, James M., to Brunswick Corporation. Fuel pump. 3,924,975, Cl. 417-395.000.

Hunt, David Patrick, to Imperial Chemical Industries Limited. Pattern printing apparatus. 3,925,791, Cl. 346-140.000.

Hunter, Byron A., to Uniroyal, Inc. Polymeric composition comprising sulfonyl carbazates as blowing agents. 3,925,270, Cl. 260-2.50R.

Hunter, Byron A., to Uniroyal, Inc. Reaction product of oxalyldihydrazide and bis(sulfonyl halide). 3,925,466, Cl. 260-543.00R.

Hunter, Edward E.; and Rye, Grover W., to Goodyear Tire & Rubber Company, The. Apparatus for treating tire cord fabric. 3,924,569, Cl. 118-642.000.

Huret, Jacques: *See—*
Huret, Roger; and Huret, Jacques, 3,924,487.

Huret, Roger; and Huret, Jacques. Cable traction and release device. 3,924,487, Cl. 74-489.000.

Hutchinson, Leigh, to Harsco Corporation. Telescopic connector for coaxially superposed frame members. 3,924,379, Cl. 52-637.000.

Hutgens, Jochen; and Adomat, Gunter, to Gutehoffnungshutte Sterkrade Aktiengesellschaft. Apparatus for treating a gas current which is obtained by coal gasification. 3,925,042, Cl. 55-269.000.

Huther, Edmund: *See—*
Schuster, Herbert; Huther, Edmund; Ott, Karl-Heinz; and Dinges, Karl, 3,925,513.

Huyffer, Paul S., to Polaroid Corporation. Processes of synthesizing AZO compounds. 3,925,347, Cl. 260-147.000.

Hwa, Jesse C. H.: *See—*
Jin, Jung Il; and Hwa, Jesse C. H., 3,925,506.

Hydromation Filter Company: *See—*
Hirs, Gene, 3,925,202.

HydroTech International, Inc.: *See—*
Arnold, James F., 3,924,686.

I.S.F. S.p.A.: *See—*
Carpi, Carlo; Dorigotti, Luciano; and Pifferi, Giorgio, 3,925,381.

Ibata, Jyoji; Kobayashi, Hidehiko; Toyomoto, Kazuo; Suzuoki, Kazuhiro; and Nogami, Sumitaka, to Asahi Kasei Kogyo Kabushiki Kaisha. Composite elastomer compositions. 3,925,272, Cl. 260-4.000.

ICI United States Inc.: *See—*
Graff, Kenneth W., 3,925,462.
Kuehn, Erich, 3,925,335.
Rutledge, Thomas F.; and Zech, John D., 3,925,009.
Wyhof, John R., 3,925,074.

ICN Pharmaceuticals, Inc.: *See—*
O'Brien, Darrell E.; Robins, Roland K.; and Springer, Robert H., 3,925,385.

Ide, Fumio; Kishida, Kazuo; and Hasegawa, Akira, to Mitsubishi Rayon Co., Ltd. Vinyl chloride polymer composition. 3,925,510, Cl. 260-876.00R.

Ideal Corporation: *See—*
Kimmelman, Samuel, 3,925,757.

Igarashi, Yuriko: *See—*
Ogura, Jiro; Seki, Ikuo; Sato, Kiyotaka; Takahashi, Masaaki; Ito, Akira; and Igarashi, Yuriko, 3,925,222.

Igel, Wolfgang, to Zinser Textilmaschinen GmbH. Apparatus for conveying and storing yarn packages or pirns. 3,924,762, Cl. 214-38.00B.

Iizuka, Yoshitoku: *See—*
Nakano, Soichi; and Iizuka, Yoshitoku, 3,924,863.

Illinois Tool Works Inc.: *See—*
Alexander, John Bert, 3,924,509.
Poupitch, Ougljesa Jules, 3,924,738.
Saari, Oliver Edward, 3,924,692.

Imperial Chemical Industries Limited: *See—*
Anderson, Robert Craig; and Gibson, James Andrew, 3,924,644.
Crosby, John; Paton, Robert Michael; and Rennie, Robert Allan Campbell, 3,925,435.
Hunt, David Patrick, 3,925,791.
McMenim, Michael Edward, 3,925,440.
Osborn, Peter George; and Nicks, Peter Francis, 3,925,295.
Osmond, Desmond Wilfrid John; Smith, Norman Douglas Patrick; and Waite, Frederick Andrew, 3,925,032.

Impulse Products Corporation: *See—*
Ottestad, Jack B., 3,924,513.

In Situ Technology, Inc.: *See—*
Terry, Ruel C., 3,924,680.

Inaba, Shigeho: *See—*
Ishizumi, Kikuo; Mori, Kazuo; Yamamoto, Michihiro; Koshiba, Masao; Inaba, Shigeho; and Yamamoto, Hisao, 3,925,382.
Maruyama, Isamu; Nakao, Masaru; Sasajima, Kikuo; Ono, Keiichi; Takayama, Masaharu; Katayama, Shigenari; Tanaka, Yoshihiro; Yanagihara, Izumi; Inaba, Shigeho; and Yamamoto, Hisao, 3,925,387.
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,925,364.

Inazumi, Tadahiro: *See—*
Shimada, Shunsaku; and Inazumi, Tadahiro, 3,925,069.

Industrial Pirelli S.p.A.: *See—*
Caretta, Renato, 3,925,141.

Industrial Woodworking Machine Co. Inc.: *See—*
Cromeens, Jeff Y., 3,924,668.

Industrie Pirelli S.p.A.: *See—*
Tangorra, Giorgio; Bertelli, Italo; and Calori, Giovanni, 3,924,670.

Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft: *See—*
Hannemann, Ludwig; and Simon, Manfred Horst, 3,924,745.

Ingham, Robert M., Jr., to Deering Milliken Research Corporation. Drafting apparatus. 3,924,297, Cl. 19-255.000.

Inouchi, Mitsuhiro: *See—*
Tanaka, Hideki; Watanabe, Mikio; Handa, Minoru; Inouchi, Mitsuhiro; Yoshioka, Shigeru; and Ishida, Kazutaka, 3,925,732.

Inoue, Hirotoshi: *See—*
Taira, Kaoru; and Inoue, Hirotoshi, 3,924,580.

Inoue, Kenji: *See—*
Sakai, Kiyoshi; Inoue, Kenji; Tajima, Yawara; Yamazaki, Mitsuo; Ohuchi, Kazuo; and Yusa, Takashi, 3,925,451.

Inoue, Kiyoshi. Measuring instrument. 3,924,336, Cl. 33-164.00R.

Institut National de la Recherche Agronomique: *See—*
Decret, Jean-Claude; Denis, Pierre; and Jourdan, Paul, 3,924,954.

Institut Pasteur: *See—*
Relyveld, Edgar Hans, 3,925,545.

Instituto Farmacologico Serono S.p.A.: *See—*
Marchetti, Enzo, 3,925,404.

Instytut Przemysku Farmaceutycznego: *See—*
Bojarska-Dahlig, Halina; and Szypka, Zdzislaw, 3,925,352.

Inter Dyne: *See—*
Betts, Paul J., 3,924,880.

International Business Machines Corporation: *See—*
Altman, Carl; Chapman, Sydney G.; and Satya, Akella V. S., 3,924,320.
Chaires, Anne Marie; Ciconte, Jean Marie; Ett, Allen Harold; Hilliard, John Joseph; and Rosenbaum, Walter Steven, 3,925,761.
Cooper, Donald Walter; and Unruh, James Bradley, 3,924,723.
Gdula, Robert A.; Raider, Stanley I.; and Revitz, Martin, 3,925,107.
Kinnard, J. Rothe, 3,925,717.
Ku, San-Mei; and Masters, Burton J., 3,925,106.
Kuhn, Robert F.; Lyons, Theodore F.; and Raider, Jerry W., 3,924,725.
Lin, Yeong S., 3,925,768.
Philbrick, John W.; and Wuestenhoefer, William C., 3,925,119.
Van Voorhis, David C., 3,925,780.

International Comador of Memphis, Inc.: *See—*
Witte, Henry C., 3,924,781.

International Harvester Company: *See—*
Canning, Michael H., 3,924,766.

International Nickel Company, Inc., The: *See—*
Fontaine, Paul Isidore; and Favillier, Louis, 3,925,059.
Kane, Robert Harvey, 3,925,259.
Shaw, Stuart Walter Ker, 3,925,072.

International Paper Company: *See—*
Furbeck, Warren R., 3,924,797.
Lee, Charles A.; and Sorrells, Frank D., 3,924,626.
Lee, Charles A.; and Furbeck, Warren R., 3,925,142.

International Standard Electric Corporation: *See—*
Esser, Karl; and Segain, John E., 3,925,571.

International Telephone and Telegraph Corporation: *See—*
de Rosa, Louis A., 3,925,730.
Edelsohn, Henry, 3,924,341.
Grayson, Richard Davis, 3,925,746.
Steensma, Peter Dennis, 3,925,740.

IPCO Hospital Supply Corporation: *See—*
Classe, Anthony V.; and Mehn, Robert P., 3,924,572.

IRECO Chemicals: *See—*
Jessop, Harvey A., 3,925,123.

Irwin, Fred, to Raymond Lee Organization Inc., a part interest. Stove top with leveling means. 3,924,602, Cl. 126-214.00A.

Irwin, John A., to General Motors Corporation. Combustion liner spring support used for hot wire igniter circuit. 3,924,403, Cl. 60-39.320.

Ishida, Kazutaka: *See—*
Tanaka, Hideki; Watanabe, Mikio; Handa, Minoru; Inouchi, Mitsuhiro; Yoshioka, Shigeru; and Ishida, Kazutaka, 3,925,732.

Ishida, Torao; Ohoishi, Junichi; Yoshida, Kouichi; Akashi, Kageyasu; Takeda, Isao, deceased; and by Takeda, Emiko, legal representative, to Asahi Kasei Kogyo Kabushiki Kaisha. Method for manufacture of novel compounds. 3,925,415, Cl. 260-335.000.

Ishigaki, Yoshio; Narahara, Hisaaki; and Tsuchiya, Takao, to Sony Corporation. Magnetic recording and/or reproducing system. 3,925,810, Cl. 358-4.000.

Ishii, Hajime; Bannai, Nubuo; and Nishita, Sadao, to Kureha Kagaku Kogyo K.K. Shaped articles of polyvinylidene fluoride. 3,925,339, Cl. 260-92.100.

Ishii, Katsutoshi: *See—*
Tatsumi, Youji; Ito, Shohei; and Ishii, Katsutoshi, 3,924,355.

Ishimura, Susumu: *See—*
Miura, Minoru; Kawasaki, Morio; Sasaki, Kantaro; Sugitani, Yasuo; and Ishimura, Susumu, 3,924,812.

Ishizumi, Kikuo; Mori, Kazuo; Yamamoto, Michihiro; Koshiba, Masao; Inaba, Shigeho; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. Process for preparing quinazoline derivatives. 3,925,382, Cl. 260-251.0QB.

Ishizumi, Kikuo: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,925,364.

Isono, Hiromasa: *See—*
Takahashi, Noboru; Nakamura, Mutsuaki; Ozaki, Sadao; Isono, Hiromasa; and Fukushima, Iwao, 3,925,114.

Ito, Akira: *See—*
Ogura, Jiro; Seki, Ikuo; Sato, Kiyotaka; Takahashi, Masaaki; Ito, Akira; and Igarashi, Yuriko, 3,925,222.

Ito, Keiichi: *See—*
Naruse, Yosuke; Yoshioka, Taisuke; Himuro, Masami; and Ito, Keiichi, 3,925,603.

Ito, Shohei: *See—*
Tatsumi, Youji; Ito, Shohei; and Ishii, Katsutoshi, 3,924,355.

Ito, Takao: *See—*
Ozeki, Takeshi; and Ito, Takao, 3,925,735.

Itoh, Hideo: *See—*
Okuda, Itsuki; Shinohara, Hiroshi; Ogawa, Haruki; and Itoh, Hideo, 3,925,555.

Iung, Jacques, to Gurtner, S.A. System for distributing pressurized gas from a liquefied gas source. 3,925,048, Cl. 62-55.000.

Iwasaki, Hiroshi: *See—*
Akamatsu, Takashi; Koga, Koichi; Kondo, Mitsuru; Miyake, Makoto; and Iwasaki, Hiroshi, 3,925,416.

Iwatani & Co., Ltd.: *See—*
Uozumi, Iwao, 3,924,506.

Izawa, Nobuo; and Kohno, Toshihiko, to Kanebo, Ltd. Method for isolating epsilon-caprolactam material. 3,925,365, Cl. 260-239.30A.

Izumi, Sumio; and Tanaka, Hiroshi, to Mitsui Mining & Smelting Co., Ltd. Method for separation of mixture of plastics. 3,925,200, Cl. 209-9.000.

Izumi, Tokio: *See—*
Suzuki, Kinya; and Izumi, Tokio, 3,925,598.

J. I. Case Company: *See—*
Lamer, Gerald P.; Zyduck, Ronald L.; and Roesler, David F., 3,924,753.
Parquet, Donald J., 3,924,650.

Jack, James: *See—*
Chalmers, Alexander Michael; Jack, James; and Cook, Barry, 3,925,376.

Jackel, Kurt: *See—*
Dittrich, Siegfried; and Jackel, Kurt, 3,924,858.

Jackson, Harold W.: *See—*
Brownell, Dudley C.; and Jackson, Harold W., 3,925,739.

Jackson, John Lambert, to John Wyeth & Brother Ltd. 2-Benzyl aziridines. 3,925,360, Cl. 260-239.00E.

Jacobsen Manufacturing Company: *See—*
Figura, William L., 3,924,706.

Jacques, Jean, to Agence Nationale de Valorisation de la Recherche (ANVAR). Disubstituted tolans and preparation thereof. 3,925,482, Cl. 260-612.00R.

Jacquot, Jean Noel, to Societe Anonyme: Poclain. Device for regulating the supply of pressurized fluid of two circuit systems having at least two pumps of constant cubic capacity. 3,924,971, Cl. 417-286.000.

Jager, Gerhard; Wenzelburger, Hans Jurgen; and Schmidt, Robert R., to Bayer Aktiengesellschaft. 6-Hydroxy-dihydro-uracils, process for their preparation. 3,925,386, Cl. 260-260.000.

Jancis, Elmar Harry, to Uniroyal, Inc. Hydrazino nickel thio-bisphenolates and polyolefins stabilized thereby against the effects of heat and light. 3,925,308, Cl. 260-45.75N.

Janin, Raymond, to Rhone-Poulenc S.A. Process for the preparation of dibenzothiazolyl disulphide. 3,925,401, Cl. 260-306.500.

Jansen, Martin B., Jr., to Vetco Offshore Industries, Inc. Pressure operated apparatus for running and setting packing assemblies in wellheads. 3,924,679, Cl. 166-182.000.

Janson, Jan-Christer: *See—*
Porath, Jerker Olof; and Janson, Jan-Christer, 3,925,152.

Janssen Pharmaceutica N.V.: *See—*
Van Gelder, Josephus Ludovicus Hubertus; Raeymaekers, Alfons Herman Margaretha; Roevens, Leopold Frans Corneel; and Van Laerhoven, Willey Joannes, 3,925,383.

Japan Bono'k Co., Ltd.: *See—*
Furutu, Akira, 3,924,788.

Japan Exlan Company Limited: *See—*
Matsumura, Yasuo; and Takeuchi, Shoichi, 3,925,291.

Japanese National Railways: *See—*
Matsui, Kazumi; Umemori, Takashi; Matsuura, Kenji; Hosoda, Yoshikado; Nishikawa, Tadashige; and Tawara, Makoto, 3,924,537.

Jardin, Thomas K., to Caterpillar Tractor Co. Mounting apparatus. 3,924,583, Cl. 123-32.0JV.

Jargon, Franz; Maschke, Erich; and Eylens, Rudolf, to Klockner-Werke AG. Method for electrochemical passivation of tinplate and electrolyte for use therein. 3,925,171, Cl. 204-56.00R.

Jefferson Chemical Company, Inc.: *See—*
Rowton, Richard Lee, 3,925,437.
Yeakey, Ernest Leon; and Austin, Thomas Howard, 3,925,389.

Jensen, William K., to General Motors Corporation. Automotive vehicle rotary display device. 3,925,752, Cl. 340-52.00F.

Jentoft, Arthur P.: *See—*
Anghinetti, Joseph R.; Couture, Paul A.; and Jentoft, Arthur P., 3,924,372.

Jerabek, Robert D., to PPG Industries, Inc. Electrodeposition process using a novel pigment dispersant. 3,925,180, Cl. 204-181.000.

Jeromin, Lothar S., to Xerox Corporation. Apparatus for developing latent electrostatic images. 3,924,568, Cl. 118-637.000.

Jersey Nuclear-Avco Isotopes, Inc.: *See—*
Munroe, James L.; and DeBaryshe, Paul Gregory, 3,924,937.

Jervis, Graham James; and Robson, Robert, to Exxon Research & Engineering Company. Antioxidant mixture comprising a mixture of phenothiazine oralkyl substituted phenothiazine and an oxidized diarylamine and lubricating oils containing said antioxidant mixture. 3,925,215, Cl. 252-47.500.

Jessop, Harvey A., to IRECO Chemicals. Pourable aqueous blasting composition. 3,925,123, Cl. 149-60.000.

Jet Ball (Eiendoms) Deperk: *See—*
Pretorius, Hillius, 3,924,855.

Jin, Jung Il; and Hwa, Jesse C. H., to Stauffer Chemical Company. Polymer modified polyols. 3,925,506, Cl. 260-836.000.

John Wyeth & Brother Ltd.: *See—*
Jackson, John Lambert, 3,925,360.

Johns-Manville Corporation: *See—*
Harris, Allan; and Huff, Lemuel Hampton, 3,924,999.
O'Connor, John Vincent, 3,924,881.

Johnson, Craig E.: *See—*
Cox, Charles D.; Johnson, Craig E.; and Henderson, Larry D., 3,925,125.

Johnson & Johnson: *See—*
Balinth, Ivan J., 3,925,271.
Dean, William Bruce, 3,924,663.

Johnson, Paul B. Rotary internal combustion engine. 3,924,579, Cl. 123-8.230.

Johnson, Robert C., to Metalogic, Inc. Expansible device for stretching material and method. 3,924,343, Cl. 38-102.100.

Johnston, Ralph H.; and Lakey, Leroy E., to General Motors Corporation. Electrically controlled fuel pump. 3,924,970, Cl. 417-220.000.

Johnstone, Colin G. Two-speed, self-propelled dolly for moving and elevating a mobile home or other load. 3,924,701, Cl. 180-6.500.

Jones, Bernard Howard: *See—*
Bartlow, David H.; Jones, Bernard Howard; and Pearson, Lee E., 3,925,132.

Jones, Charles, to Curtiss-Wright Corporation. Doweling construction for rotary engine housing. 3,924,581, Cl. 123-8.450.

Jones, James Allen: *See—*
Zipperian, Donald Edwin; Jones, James Allen; and Buza, Thomas Brian, 3,925,218.

Jones, Trevor O.: *See—*
Auman, John T.; Rogers, Wesley A.; and Jones, Trevor O., 3,925,753.

Jonsson, Erik Alfon: *See—*
Fahlstrom, Per Anders Herman Henningsson; and Jonsson, Erik Alfon, 3,924,814.

Jordan, Rodney W.: *See—*
Gulbis, Imants; and Jordan, Rodney W., 3,925,675.

Jorgensen, August H., to B. F. Goodrich Company, The. Vulcanizable acrylate rubber compositions. 3,925,281, Cl. 260-23.0AR.

Josey, Alden Dwayne; and Kirchner, Jack Robert, to Du Pont de Nemours, E. I., and Company. Substituted 1,3,7-octatrienes and their preparation. 3,925,497, Cl. 260-677.00R.

Josey, Verlon E.: *See—*
Chapman, John H.; Smith, Randolph O.; and Josey, Verlon E., 3,924,813.

Jourdan, Paul: *See—*
Decret, Jean-Claude; Denis, Pierre; and Jourdan, Paul, 3,924,954.

Jubb, Ronald: *See—*
Crownshaw, Robert; and Jubb, Ronald, 3,924,358.

Judge International Limited: *See—*
Elliott, Anthony, 3,924,303.

Julian, Clarence L.; and Young, Robert E., to General Motors Corporation. Vacuum control assembly. 3,924,586, Cl. 123-117.00A.

Junghans, Klaus, to Schering aktiengesellschaft. Electrocatalytic hydrogenation process. 3,925,173, Cl. 204-73.00R.

Jurd, Leonard: *See—*
Bultman, John D.; Jurd, Leonard; and Ritchie, Donald D., 3,925,558.

Jursakov, Anatoly Illarionovich: *See—*
Talis, Nikolai Semenovich; and Jursakov, Anatoly Illarionovich, 3,924,996.

Juvkam-Wold, Hans C., to Gulf Research & Development Company. Drill bit and method of drilling. 3,924,698, Cl. 175-393.000.

K.M. Engineering Aktiengesellschaft at Herrengrabenweg: *See—*
Hortig, Wilhelm, 3,924,437.

Kabat, Richard W.: *See—*
Lievens, Ronald J.; and Kabat, Richard W., 3,924,964.

Kabushiki Kaisha Hukuba Future Research: *See—*
Hukuba, Hiroshi, 3,924,285.

Kabushiki Kaisha Koparu: *See—*
Wada, Yasuhiro; and Okabe, Katsuhiko, 3,925,778.

Kabushiki Kaisha Ono Sokki Seiksakusho: *See—*
Konomi, Toshiaki; and Takamura, Akio, 3,924,445.
Takamura, Akio; and Harada, Tsutomu, 3,924,467.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Oshima, Yujiro; Kataoka, Masao; Tutui, Osamu; Shibayama, Noboru; Ohtuka, Masayoshi; and Ozaki, Shigehito, 3,924,457.

Kachur, Nicholas W.; and Tomburo, Anthony F., to Gibson Associates Incorporated. Two-compartment container. 3,924,741, Cl. 206-221.000.

Kaftan, Alojz Karol. Whistle. 3,924,560, Cl. 116-140.000.

Kah, Carl L. C., Jr. Sequencing valve. 3,924,652, Cl. 137-119.000.

Kain, Calvin L. Protective hub cap for bicycles. 3,924,898, Cl. 301-108.0SC.

Kaiser, Rudolf. Flame ionization detector. 3,925,023, Cl. 23-254.0EF.

Kaiya, Atsushi: *See—*
Horii, Hideo; Kaiya, Atsushi; and Otsuki, Yutaka, 3,925,279.

Kakeya, Nobuharu: *See—*
Sugimoto, Keiichi; Nishijima, Kouji; and Kakeya, Nobuharu, 3,925,362.

Kalfus, Martin Aaron, to RCA Corporation. Integral cycle zero-voltage switching circuits. 3,925,688, Cl. 307-252.00B.

Kalninsh, Arvid Yanovich: *See—*
Pormale, Milda Yanovna; Kashkina, Nadezhda Alexandrovna; Veinberg, Elfrida Indrikovna; Kalninsh, Arvid Yanovich; Shusters, Janis; Mikazhans, Valdis Danielovich; Purvinsh, Indulis Valdovich; and Skutelis, Antons Petrovich, 3,925,356.

Kalopissis, Gregoire; Bugaut, Andree; and Zorayan, Vahan, to L'Oreal. Nitroparaphenylene diamine derivatives and methods of making them. 3,925,474, Cl. 260-570.50P.

Kalversberg, Manfred, to Volkswagenwerk Aktiengesellschaft. Hydrodynamic-mechanical transmission for automobiles. 3,924,491, Cl. 74-763.000.

Kamahara, Koichi: *See—*
Watanabe, Jinzo; Terao, Noboru; Kamahara, Koichi; Miyashita, Kazuhisa; and Fujihira, Kenji, 3,925,802.

Kaman Sciences Corporation: *See—*
Church, Peter K.; and Knutson, Oliver J., 3,925,575.

Kameda, Floyd Masato: *See—*
Dahl, Klaus Joachim; and Kameda, Floyd Masato, 3,925,307.

Kamei, Masutada, to Agency of Industrial Science & Technology. Method for producing flame-retardant fireproof clear coat. 3,925,137, Cl. 156-278.000.

Kamihigoshi, Tutomu: *See—*
Ukaji, Rokuo; Kamihigoshi, Tutomu; Mikami, Kenji; and Takaki, Shoji, 3,925,263.
Ukaji, Rokuo; Kamihigoshi, Tutomu; Mikami, Kenji; and Takaki, Shoji, 3,925,492.

Kammlade, William G., Jr.: *See—*
Shechmeister, Isaac L.; Kolar, Joseph R., Jr.; and Kammlade, William G., Jr., 3,925,544.

Kane, George C.: *See—*
Whitcombe, John A.; Van Zanten, Kenneth D.; and Kane, George C., 3,925,190.

Kane, Robert Harvey, to International Nickel Company, Inc., The. Catalytic structure for the purification of waste gases and its method of preparation. 3,925,259, Cl. 252-470.000.

Kanebo, Ltd.: *See—*
Izawa, Nobuo; and Kohno, Toshihiko, 3,925,365.
Makino, Syoso; Hosokawa, Kenjiro; and Sano, Junzi, 3,925,008.

Kaneko, Minoru: *See—*
Mitsuhashi, Shigeru; Hirokawa, Kyoichi; Saito, Noboru; Kaneko, Minoru; Shoji, Michihiro; Kowada, Masunari; and Kazama, Yasuo, 3,924,330.

Kaneko, Yasuhisa: *See—*
Yabuta, Tozo; Kaneko, Yasuhisa; and Morita, Akiyoshi, 3,925,252.

Kanno, Takashi, to Chugai Seiyaku Kabushiki Kaisha. Method for simultaneous determination of enzymatic activities of enzymes. 3,925,162, Cl. 195-103.50R.

Kanto Seiki Co., Ltd.: *See—*
Hata, Shigeki, 3,925,755.

Kanzaki Paper Manufacturing Co., Ltd.: *See—*
Akamatsu, Takashi; Koga, Koichi; Kondo, Mitsuru; Miyake, Makoto; and Iwasaki, Hiroshi, 3,925,416.

Karadavidoff, Isaac; and Moreau, Michele, to Fuveau S.A. Pharmaceutical composition containing 1-carboxamidine pyrozoles and their acid addition salts and use of same. 3,925,552, Cl. 424-273.000.

Karatjas, Manuel: *See—*
Balamuth, Lewis; Kuris, Arthur; and Karatjas, Manuel, 3,924,335.

Kardashian, Vahram S., to Honeywell Inc. Monotonically changing skew in a magnetostrictive anisotropic thin film plated wire line sensor. 3,925,593, Cl. 174-36.000.

Karino, Kimiji: *See—*
Hosho, Yukio; Oyama, Yoshishige; and Karino, Kimiji, 3,924,407.

Karkov, Otto. Method of producing resin-containing pigment preparations. 3,925,096, Cl. 106-309.000.

Karlen, Bo Lennart: *See—*
Dahlbom, Johan Richard; Karlen, Bo Lennart; and Lindgren, Sune Gunnar, 3,925,411.

Karlfors, Levi Johannes: *See—*
Brannstrom, Kurt Osten; and Karlfors, Levi Johannes, 3,924,691.

Kartridg Pak Co., The: *See—*
Leonard, George E., 3,924,732.

Kashio, Toshio, to Casio Computer Co., Ltd. Route guiding apparatus. 3,925,641, Cl. 235-150.200.

Kashio, Toshio, to Casio Computer Co., Ltd. Ink jet recording apparatus. 3,925,788, Cl. 346-75.000.

Kashio, Toshio, to Casio Computer Co., Ltd. Ink jet recording apparatus. 3,925,789, Cl. 346-75.000.

Kashkina, Nadezhda Alexandrovna: *See—*
Pormale, Milda Yanovna; Kashkina, Nadezhda Alexandrovna; Veinberg, Elfrida Indrikovna; Kalninsh, Arvid Yanovich; Shusters, Janis; Mikazhans, Valdis Danielovich; Purvinsh, Indulis Valdovich; and Skutelis, Antons Petrovich, 3,925,356.

Kaspers, Helmut: *See—*
Kuhle, Engelbert; Grewe, Ferdinand; and Kaspers, Helmut, 3,925,443.

Katamoto, Kazuyoshi: *See—*
Nara, Kiyoshi; Katamoto, Kazuyoshi; Ohta, Kazuhiko; and Fukuda, Hideo, 3,925,465.

Kataoka, Masao: *See—*
Oshima, Yujiro; Kataoka, Masao; Tutui, Osamu; Shibayama, Noboru; Ohtuka, Masayoshi; and Ozaki, Shigehito, 3,924,457.

Katata, Motohiro: *See—*
Mitsushima, Hirotsugu; and Katata, Motohiro, 3,925,327.

Katayama, Shigenari: *See—*
Maruyama, Isamu; Nakao, Masaru; Sasajima, Kikuo; Ono, Keiichi; Takayama, Masaharu; Katayama, Shigenari; Tanaka, Yoshihiro; Yanagihara, Izumi; Inaba, Shigeho; and Yamamoto, Hisao, 3,925,387.

Kather, Kenneth Calvin: *See—*
Patterson, Michael Frederick; and Kather, Kenneth Calvin, 3,925,041.

Kato, Hiroyuki: *See—*
Azuma, Kishiro; Tsuji, Isao; Kato, Hiroyuki; Tatemichi, Hidemaro; Motegi, Akira; Suzuki, Osamu; and Kondo, Kishichiro, 3,925,322.

Kato, Kunihiro; Matsuda, Ryoichi; and Okayasu, Ryoichi, to Nippon Telegraph and Telephone Public Corporation. Voice switch circuits for use in loudspeaking telephone circuits. 3,925,618, Cl. 179-1.0VC.

Kato, Tetsuo; and Sekio, Isao, to Daido Seiko Kabushiki Kaisha. Electromagnetic stainless steel having excellent machinability. 3,925,063, Cl. 75-124.000.

Kato, Toshiro: *See—*
Tottori, Nobumasa; Kato, Toshiro; Asano, Yasuhisa; Ueda, Minoru; Kirino, Osamu; Ooba, Shigehiro; Fujinami, Akira; and Ozaki, Toshiaki, 3,925,554.

Katsimbas, Themistoklis, to Hoechst Aktiengesellschaft. Heat-curable pulverulent coating agent consisting of a mixture of copolymers containing glycidyl groups, dicarboxylic acid anhydrides and curing accelerators. 3,925,507, Cl. 260-836.000.

Kaufman, Michael Avrum: *See—*
Sollazzi, Pasquale Robert; and Kaufman, Michael Avrum, 3,924,872.

Kawahara, Kiyoshi: *See—*
Fukushima, Seitaro; and Kawahara, Kiyoshi, 3,925,057.

Kawai, Hajime: *See—*
Tsunemitsu, Katsuhiko; Kiuchi, Kanji; Nakai, Yasushi; Kawai, Hajime; and Yamada, Shimpei, 3,925,457.

Kawakita, Takao: *See—*
Osawa, Makoto; Hagiwara, Yoshitoshi; Kusaka, Kunio; Kawakita, Takao; Motoyoshi, Kenya; and Kuroishi, Nobuhito, 3,925,065.

Kawano, Tsuyoshi: *See—*
Takechi, Hiroshi; Kawano, Tsuyoshi; Hashizume, Toshio; Koyama, Kazuo; and Masui, Hiroaki, 3,925,111.

Kawasaki, Morio: *See—*
Miura, Minoru; Kawasaki, Morio; Sasaki, Kantaro; Sugitani, Yasuo; and Ishimura, Susumu, 3,924,812.

Kay, Edward L.: *See—*
Hausch, Walter R.; Fieldhouse, John W.; and Kay, Edward L., 3,925,590.

Kay Laboratories, Inc.: *See—*
Chapin, Nancy L., 3,924,603.

Kayser, Detlev: *See—*
Dahm, Johann; Borck, Joachim; Nowak, Herbert; Zimane, Zdenek; and Kayser, Detlev, 3,925,394.

Kazama, Yasuo: *See—*
Mitsuhashi, Shigeru; Hirokawa, Kyoichi; Saito, Noboru; Kaneko, Minoru; Shoji, Michihiro; Kowada, Masunari; and Kazama, Yasuo, 3,924,330.

Kealy, Joseph P., to Swift Chemical Company. Slow acting fertilizer. 3,925,053, Cl. 71-29.000.

Keat, Paul P., to Norton Company. Graphite containing metal bonded diamond abrasive wheels. 3,925,035, Cl. 51-309.000.

Keck, Merle E.: *See—*
Elms, Robert T.; and Keck, Merle E., 3,925,705.

Keegel, Joseph F., Jr.: *See—*
Kutler, Andrew A.; and Keegel, Joseph F., Jr., 3,925,003.

Keller, Pierre: *See—*
Brandli, Gerold; and Keller, Pierre, 3,924,469.

Keller, William Francis: *See—*
Lentine, Frank Nickolis; and Keller, William Francis, 3,924,334.

Kelly, Donald H.: *See—*
Bruen, Charles P.; and Kelly, Donald H., 3,925,538.

Kendall Company, The: *See—*
Samour, Carlos M., 3,925,442.
Taylor, Glenn M.; Patel, Harish A.; and McWhorter, Daniel M., 3,924,634.

Kendall, Giles A.; Bhutani, Harish K.; and Minick, Robert, to Menasco Manufacturing Company. Missile support system. 3,924,511, Cl. 89-1.800.

Kennametal Inc.: *See—*
College, Michael A., 3,924,697.

Kennedy, Carl D.: *See—*
Clark, Charles R.; Gregory, M. Duane; Casad, Burton M.; Krehbiel, Delmar D.; and Kennedy, Carl D., 3,924,681.

Kennedy, John R. Rotary drilling method and apparatus. 3,924,695, Cl. 175-69.000.

Kennedy, Paul G.: *See—*
Wood, Kenneth E.; Parrish, William F.; and Kennedy, Paul G., 3,925,606.

Kenney, George Churchill, to North American Philips Corporation. Apparatus having dropout detection and compensation for reproducing a video signal recorded on a record. 3,925,811, Cl. 358-8.000.

Kent, John Allen; Love, Robert B.; and Meyer, Harold Louis, to Amsted Industries Incorporated. Fifth wheel. 3,924,909, Cl. 308-136.000.

Kerho, Stephen E.; Lindquist, Claude S.; White, John R.; and Breen, Bernard P., to KVB Equipment Corporation. Pollutant variation correcting system. 3,924,442, Cl. 73-1.00R.

Kern, Fred R., Jr.: *See—*
Spivack, Mayer; and Kern, Fred R., Jr., 3,924,870.

Kerzel, Gunter, to Olympia Werke AG. Structure for facilitating interchange of typing elements. 3,924,724, Cl. 197-52.000.

Kessler, Claus; and Beier, Helmut, to Siemens Aktiengesellschaft. Contact arrangement for a high-voltage power circuit breaker. 3,925,631, Cl. 200-148.00R.

Kessler, Hartmut; and Kraus, Hubert, to Siemens Aktiengesellschaft. Vapor deposition on electrostatically tensioned foil. 3,924,563, Cl. 118-49.100.

Khan, Ausat Ali, to Du Pont de Nemours, E. I., and Company. Preparation of sol chloroprene polymers. 3,925,340, Cl. 260-92.300.

Khosla, Mahesh Chandra: *See—*
Bumpus, Francis Merlin; Khosla, Mahesh Chandra; and Smeby, Robert Rudolph, 3,925,345.

Khouri, Robert N.: *See—*
Walker, Frank H.; Blumer, Larry D.; Khouri, Robert N.; and Fulks, David G., 3,924,483.

Kidwell, Raymond A. Ground anchor apparatus. 3,924,371, Cl. 52-161.000.

Kieras, Joseph A.: *See—*
Shalit, Harold; and Kieras, Joseph A., 3,925,496.

Kihara, Nobutoshi, to Sony Corporation. Magnetic recording system with overlapping tracks of high and low frequency information. 3,925,816, Cl. 360-19.000.

Kilbourn, Edward E.; and Weiler, Ernest D., to Rohm & Haas Company. 3-Pyridylmethyl-(N-substituted phenyl)-carbamate derivatives. 3,925,397, Cl. 260-294.900.

Kim, Dong H., to American Home Products Corporation. 2,3,4,5-Tetrahydro-1H-1,4-benzodiazepine-4-carboxamidines. 3,925,361, Cl. 260-239.0BD.

Kimmel, Robert M.; Riggs, John P.; Swander, Robert W.; and Whitney, Wells, to Celanese Corporation. Process for the production of carbon filaments. 3,925,524, Cl. 264-29.000.

Kimmelman, Samuel, to Ideal Corporation. Turn signal system for positive indication of lamp failure. 3,925,757, Cl. 340-66.000.

Kimura, Hiroshi, to Hughes Aircraft Company. Preparation of monocrystalline lead tin telluride. 3,925,147, Cl. 156-603.000.

Kindel, Erik Lennart, to LKB-Produkter AB. Device in a microtome for holding a grid on which sections are collected. 3,924,500, Cl. 83-167.000.

Kindl, George F., to Colt Industries Operating Corporation. Rotary positioning apparatus and method. 3,924,338, Cl. 33-174.0TC.

King, Charles Morgan; Seidel, William Carl; and Tolman, Chadwick Alma, to Du Pont de Nemours, E. I., and Company. Hydrocyanation of olefins. 3,925,445, Cl. 260-465.00R.

King, Wendell L., to Medtronic, Inc. Implantable electrically powered medical device. 3,924,640, Cl. 128-419.00P.

Kinnard, J. Rothe, to International Business Machines Corporation. Inductive base drive for transistor switching in DC converters. 3,925,717, Cl. 321-2.000.

Kinney, Alfred W., to Phillips Petroleum Company. Method and apparatus for capping containers. 3,924,384, Cl. 53-38.000.

Kipnis, Aharon: *See—*
Manor, Gedalyahu, 3,924,689.

Kirchner, Jack Robert: *See—*
Josey, Alden Dwayne; and Kirchner, Jack Robert, 3,925,497.

Kirino, Osamu: *See—*
Tottori, Nobumasa; Kato, Toshiro; Asano, Yasuhisa; Ueda, Minoru; Kirino, Osamu; Ooba, Shigehiro; Fujinami, Akira; and Ozaki, Toshiaki, 3,925,554.

Kishida, Kazuo: *See—*
Ide, Fumio; Kishida, Kazuo; and Hasegawa, Akira, 3,925,510.

Kita, Stanley B. Automatic lawn mower. 3,924,389, Cl. 56-10.200.

Kitanata, Koziro: *See—*
Takamura, Akira; Shimogori, Kazutoshi; Yamagata, Toshiaki; Sato, Masao; and Kitanata, Koziro, 3,925,064.

Kitaoka, Hiroo, to Reliance Electric Company. Electrically insulated bearing and for reducing shaft current. 3,924,906, Cl. 308-1.00R.

Kitchel, George B. Machine and method for grinding and polishing beads and marbles. 3,924,356, Cl. 51-7.000.

Kiuchi, Kanji: *See—*
Tsunemitsu, Katsuhiko; Kiuchi, Kanji; Nakai, Yasushi; Kawai, Hajime; and Yamada, Shimpei, 3,925,457.

Klauke, Erich: *See—*
Wolfrum, Gerhard; Sommer, Richard; and Klauke, Erich, 3,925,350.

Klebert, Wolfgang: *See—*
Schafer, Karl; Schuster, Hans; and Klebert, Wolfgang, 3,925,581.

Kleimann, Helmut; von Bonin, Wulf; Schneider, Heinz-Georg; and Gebauer, Herbert, to Bayer Aktiengesellschaft. Method of making foamed urethane resins having improved mold release properties. 3,925,527, Cl. 264-53.000.

Klein, Imrich; and Tadmor, Zehev, to Scientific Process & Research, Inc. Apparatus for preparing a plasticated material. 3,924,842, Cl. 259-192.000.

Kleinschmidt, Peter: *See—*
Wolf, Gerhard Dieter; Kunzel, Hans Egon; Blankenstein, Gunther; Kleinschmidt, Peter; and Bentz, Francis, 3,925,310.

Klemm, Peter; and Schulze, Klaus, to Volkswagenwerk Aktiengesellschaft. Fail-safe throttle for an internal combustion engine. 3,924,596, Cl. 123-198.00D.

Klepfer, Harold H., to General Electric Company. Nuclear fuel element. 3,925,151, Cl. 176-68.000.

Klier, Lothar: *See—*
Althausen, Ferdinand; Boden, Heinrich; Ersfeld, Heinz; Klier, Lothar; Raffel, Reiner; and Schneider, Walter, 3,924,989.

Klingler, Friedrich, to Maschinenfabrik Augsburg-Nurnberg A.G. Spray dampener for rotary press. 3,924,531, Cl. 101-147.000.

Klingler, Thomas C.: *See—*
Goralski, Christian T.; and Klingler, Thomas C., 3,925,468.

Klockner-Werke AG: *See—*
Jargon, Franz; Maschke, Erich; and Eylens, Rudolf, 3,925,171.

Klunsch, Maximilian: *See—*
Berthmann, Adolf; Martin, Gerhard; and Klunsch, Maximilian, 3,925,122.

Knapp, Kenneth K.: *See—*
Cornell, Charles R.; Simpson, Dennis D.; and Knapp, Kenneth K., 3,924,410.

Knechtges, Donald P.; and Mikoflavy, Bela K., to B. F. Goodrich Company, The. Low-temperature curable latices of vinyl and acrylic monomers. 3,925,293, Cl. 260-29.6TA.

Knis, Stephen A.; and Sayigh, Adnan A. R., to Upjohn Company, The. Agitator insert for reactive liquid polymer mixer. 3,924,837, Cl. 259-8.000.

Knutson, Oliver J.: *See—*
Church, Peter K.; and Knutson, Oliver J., 3,925,575.

Kobashi, Kiyoshi: *See—*
Nohira, Hidetaka; and Kobashi, Kiyoshi, 3,924,589.

Kobayashi, Hidehiko: *See—*
Ibata, Jyoji; Kobayashi, Hidehiko; Toyomoto, Kazuo; Suzuoki, Kazuhiro; and Nogami, Sumitaka, 3,925,272.

Kobayashi, Isamu, to Sony Corporation. Oriented polycrystal jfet. 3,925,803, Cl. 357-22.000.

Kobayashi, Teruo: *See—*
Sugi, Ichirow; Takenaka, Haruo; Okiyama, Toshiaki; and Kobayashi, Teruo, 3,925,573.

Kobayashi, Toshiaki: *See—*
Murai, Koichi; Choshi, Yasuo; and Kobayashi, Toshiaki, 3,925,278.

Kobayashi, Tsuyoshi: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,925,364.

Kobe Machinery Company, Ltd.: *See—*
Sarumaru, Kazumasa, 3,924,981.

Kobe Steel Ltd.: *See—*
Takamura, Akira; Shimogori, Kazutoshi; Yamagata, Toshiaki; Sato, Masao; and Kitanata, Koziro, 3,925,064.

Koch, Paolo; and Perrotti, Emilio, to Snamprogetti S.p.A. Process for the production of cyclic thiocarbonates. 3,925,413, Cl. 260-327.00M.

Kochka, Edgar L.: *See—*
Fatzer, Elmer G.; and Kochka, Edgar L., 3,925,577.

Kodera, Yoichi, to Sony Corporation. Method of making electret. 3,924,324, Cl. 29-592.000.

Koehring Company: *See—*
Brown, Gaylord W., 3,925,140.

Koeleman, Geradus A. J.; and op de Laak, Johannes H. A., to Pitney-Bowes, Inc. Apparatus and process for developing electrostatic. 3,924,567, Cl. 118-637.000.

Koepfle, Frank Xavier; and Grote, Herbert Edward, to Procter & Gamble Company, The. Non-caking laundry sour. 3,925,230, Cl. 252-136.000.

Koernig, Wolfgang: *See—*
Schlichting, Karl; Horn, Peter; Schlag, Johannes; and Koernig, Wolfgang, 3,925,306.

Kofoid, Melvin J., to Boeing Company, The. Method and apparatus for heating solid and liquid particulate material to vaporize or disassociate the material. 3,925,177, Cl. 204-164.000.

Koga, Koichi: *See—*
Akamatsu, Takashi; Koga, Koichi; Kondo, Mitsuru; Miyake, Makoto; and Iwasaki, Hiroshi, 3,925,416.

Kogure, Hiroshi: *See—*
Miyaki, Kiyoshi; and Kogure, Hiroshi, 3,924,590.
Miyaki, Kiyoshi; and Kogure, Hiroshi, 3,924,592.
Yagi, Shizuo; Miyaki, Kiyoshi; and Kogure, Hiroshi, 3,924,582.

Kogure, Katsura; and Nakagawa, Kunio, to Nisshin Flour Milling Co., Ltd. Process for preparing 2-(4-alkylphenyl)-propion-aldehyde and propionic acid. 3,925,458, Cl. 260-523.00A.

Kohayakawa, Yoshimi: *See—*
Matsumura, Isao; and Kohayakawa, Yoshimi, 3,925,793.

Kohjin Co., Ltd.: *See—*
Matsuo, Kazuto; Araki, Michiya; Matsugu, Tomoyuki; and Mikami, Takahito, 3,925,290.

Kohler, Jacques R.; and Binsbergen, Frederik L., to Shell Oil Company. Rubber improvement with polycyclopentene. 3,925,514, Cl. 260-889.000.

Kohn, Gustave K., administrator: *See*—
Brown, Melancthon S., deceased; and Kohn, Gustave K., administrator, 3,925,056.

Kohno, Toshihiko: *See*—
Izawa, Nobuo; and Kohno, Toshihiko, 3,925,365.

Kohrn, Edward Louis; and Globus, Seymour. Gold/silver alloys. 3,925,066, Cl. 75-134.00C.

Kohrn, Edward Louis; and Globus, Seymour. Gold/silver alloys. 3,925,073, Cl. 75-173.00C.

Koivunen, Erkki A., to General Motors Corporation. Accessory shaft drive for a rotary machine. 3,924,577, Cl. 123-8.010.

Kojima, Makoto; Noda, Yuzuru; Suzuki, Yasuhiro; and Okamoto, Toshihide, to Nitto Electric Industrial Co., Ltd. Polyimide water-soluble composition. 3,925,313, Cl. 260-47.0CP.

Kojima, Shiro: *See*—
Aoyagi, Katumi, 3,925,585.

Kokado, Naoyuki, to Tokyo Shibaura Electric Co., Ltd. Apparatus for extracting a vertical synchronizing pulse from a composite synchronizing signal included in a video signal. 3,925,613, Cl. 178-69.5TV.

Kolar, Joseph R., Jr.: *See*—
Shechmeister, Isaac L.; Kolar, Joseph R., Jr.; and Kammlade, William G., Jr., 3,925,544.

Koleske, Joseph Victor; Whitworth, Clyde Jesse, Jr.; and Lundberg, Robert Dean, to Union Carbide Corporation. Poly(hydroxy ether) polymers blended with cyclic ester polymers. 3,925,504, Cl. 260-823.000.

Komoda, Tsutomu: *See*—
Nomura, Setsuo; Komoda, Tsutomu; and Nakaizumi, Yasushi, 3,925,706.

Kondo, Eiji; Mitsugi, Takashi; and Muneyuki, Ryonosuke, to Shionogi & Co., Ltd. Preparation of 6-aminopenicillanic acid 1-oxide. 3,925,155, Cl. 195-36.00P.

Kondo, Fusao: *See*—
Takenouchi, Kuniyoshi; Ohno, Norihiro; and Kondo, Fusao, 3,925,226.

Kondo, Kishichiro: *See*—
Azuma, Kishiro; Tsuji, Isao; Kato, Hiroyuki; Tatemichi, Hidemaro; Motegi, Akira; Suzuki, Osamu; and Kondo, Kishichiro, 3,925,322.

Kondo, Mitsuru: *See*—
Akamatsu, Takashi; Koga, Koichi; Kondo, Mitsuru; Miyake, Makoto; and Iwasaki, Hiroshi, 3,925,416.

Konomi, Toshiaki; and Takamura, Akio, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Ono Sokki Seiksakusho. Flow rate measuring system with calibration means. 3,924,445, Cl. 73-3.000.

Konstantin, Anatole E. Banding machine. 3,924,387, Cl. 53-291.000.

Kontes Glass Company: *See*—
Thoden, John; and Wagner, Theodore, 3,924,948.

Koos, Josef, to Gertsch AG. Spring locking device. 3,924,867, Cl. 280-11.35T.

Koos, Josef, to Gertsch AG. Ski binding having an adjustable heel holder. 3,924,868, Cl. 280-11.35K.

Koplin, Harry: *See*—
Prenner, Amnon; Bear, Jacob; Tohar, David; and Koplin, Harry, 3,924,677.

Koppe, Herbert; Kummer, Werner; Stahle, Helmut; and Muacevic, Gojko, to Boehringer Ingelheim GmbH. 1-Aryloxy-2-hydroxy-3-alkynylamino-propanes. 3,925,446, Cl. 260-465.00E.

Kornylak, Andrew T., to Kornylak Corporation. Adjustable support. 3,924,718, Cl. 193-35.00R.

Kornylak Corporation: *See*—
Kornylak, Andrew T., 3,924,718.

Korrell, Melvin H.; and Gay, Sandy C., to Nibco Inc. Cam controlled variable speed drive for clothes dryer. 3,924,833, Cl. 74-242.400.

Koshiba, Masao: *See*—
Ishizumi, Kikuo; Mori, Kazuo; Yamamoto, Michihiro; Koshiba, Masao; Inaba, Shigeho; and Yamamoto, Hisao, 3,925,382.

Kosinsky, Edward J., to Phillips Petroleum Company. Apparatus for drying polymeric material. 3,924,997, Cl. 425-376.000.

Kovar, Stanislav; Cernocky, Jiri; and Riha, Petr, to Zbrojovka Vsetin, narodni podnik. Arrangement for equalizing the tension of two supplied threads. 3,924,820, Cl. 242-126.000.

Kowada, Masunari: *See*—
Mitsuhashi, Shigeru; Hirokawa, Kyoichi; Saito, Noboru; Kaneko, Minoru; Shoji, Michihiro; Kowada, Masunari; and Kazama, Yasuo, 3,924,330.

Koyama, Kazuo: *See*—
Takechi, Hiroshi; Kawano, Tsuyoshi; Hashizume, Toshio; Koyama, Kazuo; and Masui, Hiroaki, 3,925,111.

Kozawa, Akiya, to Union Carbide Corporation. Divalent silver oxide cell having a unipotential discharge level. 3,925,102, Cl. 136-111.000.

Kozo Yoshizaki: *See*—
Misonoo, Kazunaga, 3,924,436.

Kozuka, Hirotsugu: *See*—
Saida, Hiroji; Ono, Yuichi; Nomura, Masayoshi; Tamura, Masao; and Kozuka, Hirotsugu, 3,925,120.

Kramer, George J. Arithmetic fact game. 3,924,859, Cl. 273-137.00C.

Krapcho, John; and Turk, Chester Frank, to E. R. Squibb & Sons, Inc. 2-Amino-4,5-dihydro-4-arylindeno pyrimidines. 3,925,384, Cl. 260-256.40Q.

Kraus, Hubert: *See*—
Kessler, Hartmut; and Kraus, Hubert, 3,924,563.

Krause, Lothar, to Hauni-Werke Korber & Co., KG. Method of uniting webs of cigarette paper or the like. 3,925,131, Cl. 156-159.000.

Krauss-Maffei Aktiengesellschaft: *See*—
Breitling, Ulrich; and Simon, Klaus, 3,924,538.

Krebs, Klaus-Werner: *See*—
Eicher, Theo; Muller, Friedemann; and Krebs, Klaus-Werner, 3,924,642.

Krehbiel, Delmar D.: *See*—
Clark, Charles R.; Gregory, M. Duane; Casad, Burton M.; Krehbiel, Delmar D.; and Kennedy, Carl D., 3,924,681.

Kremer, Ross A.; and Leitman, Richard H., to Mobil Oil Corporation. Deodorized mercaptan-containing phosphorotrithioites and process of preparation. 3,925,519, Cl. 260-967.000.

Krenzer, John, to Velsicol Chemical Corporation. Method of increasing the yield of plants having storage organs by treatment with triazolidinones. 3,925,054, Cl. 71-92.000.

Krenzer, John, to Velsicol Chemical Corporation. 1-Thiadiazolyl-5-carbamoyloxyimidazolidinones. 3,925,402, Cl. 260-306.80D.

Krenzer, John, to Velsicol Chemical Corporation. Certain 1-(2-substituted-1,3,4-thiadiazol-5-yl)-3-alkyl-imidazolidin-2-ones. 3,925,403, Cl. 260-306.80D.

Kreutze, Gerhard: *See*—
Moessner, Manfred; and Kreutze, Gerhard, 3,924,822.

Krieger, Josef: *See*—
Obendorf, Werner; Lindner, Irmgard; Schwarzinger, Ernst; and Krieger, Josef, 3,925,412.

Kroger, Harry; and Potier, Curtis N., to Sperry Rand Corporation. High frequency diode and method of manufacture. 3,925,078, Cl. 96-36.200.

Kroger, Ingo: *See*—
Richter, Martin; and Kroger, Ingo, 3,925,694.

Kroschel, Heinz: *See*—
Strunk, Manfred; Kroschel, Heinz; and Voss, Alfred, 3,924,510.

Kruppert, Frederick W.: *See*—
Franceschina, Louis E.; Haromy, Fred; and Kruppert, Frederick W., 3,924,435.

Krups, Robert: *See*—
Schubert, Klaus; and Grohmann, Klaus, 3,924,816.

Ku, San-Mei; and Masters, Burton J., to International Business Machines Corporation. Ion bombardment method of producing integrated semiconductor circuit resistors of low temperature coefficient of resistance. 3,925,106, Cl. 148-1.500.

Kubovy, Miloslav: *See*—
Esser, Miroslav; Ledr, Zdenek; Ferkl, Frantisek; Kubovy, Miloslav; Ripka, Josef; Hortlik, Frantisek; and Elias, Jiri, 3,924,398.

Kuchar, Paul J.: *See*—
Boney, William G.; and Kuchar, Paul J., 3,925,502.

Kuehn, Erich, to ICI United States Inc. Vinyl urethane resins from halogenated diols and phosphonate diols. 3,925,335, Cl. 260-859.00R.

Kufner, Kenneth L., to Molex Incorporated. Method and apparatus for mounting terminal pins from a single side of a double sided terminal board. 3,924,325, Cl. 29-626.000.

Kuhle, Engelbert; Grewe, Ferdinand; and Kaspers, Helmut, to Bayer Aktiengesellschaft. Alkylsulphuric acid salts of substituted guanidines. 3,925,443, Cl. 260-459.00R.

Kuhlthau, Hans-Peter, to Bayer Aktiengesellschaft. Process for dyeing anionically modified synthetic fiber materials. 3,925,015, Cl. 8-168.000.

Kuhn, Hans-Robert, to Electroacustic GmbH Kiel. Electromagnetic sound pick-up. 3,925,628, Cl. 179-100.41K.

Kuhn, Robert F.; Lyons, Theodore F.; and Raider, Jerry W., to International Business Machines Corporation. Dual array disc printer. 3,924,725, Cl. 197-53.000.

Kuhnle, Judith A.: *See*—
Randall, John M.; Hautala, Earl; Waiss, Anthony C., Jr.; and Kuhnle, Judith A., 3,925,192.

Kulite Semiconductor Products, Inc.: *See*—
Kurtz, Anthony D.; Brosh, Amnon; Gravel, Charles L.; and Mallon, Joseph R., 3,924,322.

Kumiai Chemical Industry Co,: *See*—
Okuda, Itsuki; Shinohara, Hiroshi; Ogawa, Haruki; and Itoh, Hideo, 3,925,555.

Kummer, Werner: *See*—
Koppe, Herbert; Kummer, Werner; Stahle, Helmut; and Muacevic, Gojko, 3,925,446.

Kun, Leslie C., to Union Carbide Corporation. Primary surface heat exchanger and manufacture thereof. 3,924,441, Cl. 72-475.000.

Kunzel, Hans Egon: *See*—
Wolf, Gerhard Dieter; Kunzel, Hans Egon; Blankenstein, Gunther; Kleinschmidt, Peter; and Bentz, Francis, 3,925,310.

Kureha Kagaku Kogyo K.K.: *See*—
Ishii, Hajime; Bannai, Nubuo; and Nishita, Sadao, 3,925,339.
Ogura, Jiro; Seki, Ikuo; Sato, Kiyotaka; Takahashi, Masaaki; Ito, Akira; and Igarashi, Yuriko, 3,925,222.

Kuris, Arthur: *See*—
Balamuth, Lewis; Kuris, Arthur; and Karatjas, Manuel, 3,924,335.

Kuroishi, Nobuhito: *See*—
Osawa, Makoto; Hagiwara, Yoshitoshi; Kusaka, Kunio; Kawakita, Takao; Motoyoshi, Kenya; and Kuroishi, Nobuhito, 3,925,065.

Kurtz, Albert L., to Hill Acme Company, The. Shearing apparatus. 3,924,504, Cl. 83-568.000.

Kurtz, Anthony D.; Brosh, Amnon; Gravel, Charles L.; and Mallon, Joseph R., to Kulite Semiconductor Products, Inc. Economical pressure transducer assemblies, methods of fabricating and mounting the same. 3,924,322, Cl. 29-580.000.

Kusaka, Kunio: *See—*
Osawa, Makoto; Hagiwara, Yoshitoshi; Kusaka, Kunio; Kawakita, Takao; Motoyoshi, Kenya; and Kuroishi, Nobuhito, 3,925,065.

Kusakawa, Hideaki: *See—*
Yoshino, Masataka; Kuwazawa, Hiroyasu; Shimojima, Haruhiko; Tanaka, Osamu; Kusakawa, Hideaki; Matsuoka, Hiromasa; and Maeda, Mitsuo, 3,925,021.

Kusenberg, Eugen: *See—*
Ernst, Otto; Meyerhans, Konrad; and Kusenberg, Eugen, 3,924,737.

Kushihashi, Akira; Fuziwara, Yutaka; and Akashi, Naotomo, to Nippon Sheet Glass Co., Ltd. Process and apparatus for producing glass having metal oxide coating. 3,925,050, Cl. 65-60.000.

Kussow, Daniel H.: *See—*
Anders, Robert; and Kussow, Daniel H., 3,924,545.

Kutler, Andrew A.; and Keegel, Joseph F., Jr., to Foster Wheeler Energy Corporation. Gas flow control system. 3,925,003, Cl. 431-89.000.

Kuts, Mathew, to B. F. Goodrich Company, The. Fabric cutting. 3,924,503, Cl. 83-488.000.

Kuwazawa, Hiroyasu: *See—*
Yoshino, Masataka; Kuwazawa, Hiroyasu; Shimojima, Haruhiko; Tanaka, Osamu; Kusakawa, Hideaki; Matsuoka, Hiromasa; and Maeda, Mitsuo, 3,925,021.

KVB Equipment Corporation: *See—*
Kerho, Stephen E.; Lindquist, Claude S.; White, John R.; and Breen, Bernard P., 3,924,442.

L & R Industries, Inc.: *See—*
Hammond, William D., 3,924,599.

La Technique Integrale: *See—*
Taillardat, Jacques, 3,924,486.

Labavia S.G.E.: *See—*
Bessiere, Pierre Etienne, 3,924,713.

Labofina S.A.: *See—*
Draguez de Hault, Emmanuel R. E. G.; Debus, Henri R.; and Van Tongelen, Marcel, 3,925,425.

Laborit, Henri, to Centre d'Etudes Experimentales et Cliniques de Physio Biologie de Pharmacologie et d'Eutonologie. Composition for conservation of blood. 3,925,153, Cl. 195-1.800.

Lafon, Jean-Louis: *See—*
Collard, Maurice A.; Cruchant, Serge Alfred; and Lafon, Jean-Louis, 3,924,830.

Laftsidis, Stergios: *See—*
Glabe, Elmer F.; Anderson, Perry W.; and Laftsidis, Stergios, 3,925,559.

Lakey, Leroy E.: *See—*
Johnston, Ralph H.; and Lakey, Leroy E., 3,924,970.

Lambert, Charles F., Jr., to Clayton & Lambert Manufacturing Company. Horizontal rotary sweeps for feed storage tanks. 3,924,761, Cl. 214-17.0CB.

Lamberti, Vincent, to Lever Brothers Company. Sulfosuccinate derivatives as detergent builders. 3,925,375, Cl. 260-247.10E.

Lamer, Gerald P.; Zyduck, Ronald L.; and Roesler, David F., to J. I. Case Company. Crane counterweight support and means for removing and mounting same. 3,924,753, Cl. 212-48.000.

Lamonica, Mercurio. Aquarium scenic filter in fish tank. 3,924,570, Cl. 119-5.000.

Lampe, Warren R., to General Electric Company. Process for packaging and mixing a two-part room temperature vulcanizable silicone rubber composition. 3,925,277, Cl. 260-18.00S.

LaMura, Joseph. Cuticle knife with storage means for hand lotion. 3,924,646, Cl. 132-79.00R.

Landis, Phillip S.; and Okorodudu, Abraham O. M., to Mobil Oil Corporation. Reaction product of isobutylene, sulfur monohalide and alkali metal mercaptide. 3,925,414, Cl. 260-327.00R.

Lang, Gunter: *See—*
Beaucamp, Klaus; Mollering, Hans; Lang, Gunter; Gruber, Wolfgang; and Roeschlau, Peter, 3,925,164.

Langdon, Robert S. Instrument sterilization. 3,925,014, Cl. 21-105.000.

Langenberg, Hartmut: *See—*
Hohnfeld, Peter; and Langenberg, Hartmut, 3,924,835.

Lanier, Carroll W., to Ethyl Corporation. Process for producing nitrilotriacetonitrile. 3,925,448, Cl. 260-465.50A.

LaNieve, Herman L., to Celanese Corporation. Spinning method. 3,925,525, Cl. 264-40.000.

Lanzenberger, Horst, to Friedrich Deckel Aktiengesellschaft. Brake mechanism to prevent reverse rotation of a drive spindle. 3,924,479, Cl. 74-89.160.

Lapinskas, Edward F. Electrical utility cord storage and shortening device. 3,924,819, Cl. 242-85.100.

Larkin, John M.: *See—*
Duranleau, Roger G.; and Larkin, John M., 3,925,430.

Laroche, Marie-Jeanne: *See—*
Gastambide, Bernard; Thal, Claude; Rohrbach, Phillippe; and Laroche, Marie-Jeanne, 3,925,480.

Latzina, Kurt: *See—*
Hess, Johann; Paule, Kurt; Latzina, Kurt; and Wolf, Richard, 3,924,961.

Laubie, Michel: *See—*
Vincent, Michel; Remond, Georges; and Laubie, Michel, 3,925,369.

Laughlin, Robert Gene; and Stewart, Robert Lee, to Procter & Gamble Company, The. Detergent composition having enhanced particulate soil removal performance. 3,925,262, Cl. 252-526.000.

Lauri, Gilles C. Cigar and cigarette lighter. 3,925,004, Cl. 431-131.000.

Lauterbach-Dammler, Inge, to C. Conradty. Exponential resistance material and method of manufacturing same. 3,925,261, Cl. 252-519.000.

Lawhon, Robert A., to PPG Industries, Inc. Removable dam barrier for a float chamber of a glassmaking apparatus. 3,925,051, Cl. 65-65.00A.

Lawlor, Kenneth A.: *See—*
Roos, Dewey A.; Lawlor, Kenneth A.; and Abadie, Erwin I., 3,924,535.

Lawrence Peska Associates, Inc.: *See—*
Cooper, Frederick, 3,924,913.

Lazarre, Flavien; Rozand, Jacques; and Roumazeilles, Simonne, to Societe Nationale des Petroles d'Aquitaine. Installation to disperse gas effluents. 3,924,658, Cl. 137-604.000.

Leasure, William C. Method and apparatus for hydraulic transportation of mined coal. 3,924,895, Cl. 299-8.000.

Leatherman, Alfred F.; and Shatzkin, Leonard, to Heller, William C., Jr. Vibratory book binding method. 3,925,126, Cl. 156-73.600.

Le Blanc, Maurice: *See—*
Riess, Jean G.; Le Blanc, Maurice; Santini, Georges; and Guion, Jacky, 3,925,491.

Lechner, Thomas G.; and Besse, Michael E., to Economics Laboratory, Inc. Corrosion inhibition or prevention with inorganic-organic complexes. 3,925,087, Cl. 106-14.000.

Leclere, Claudine: *See—*
Bono, Pierre; Demange, Philippe; Leclere, Claudine; and Tissier, Alexis, 3,925,099.

Ledr, Zdenek: *See—*
Esser, Miroslav; Ledr, Zdenek; Ferkl, Frantisek; Kubovy, Miloslav; Ripka, Josef; Hortlik, Frantisek; and Elias, Jiri, 3,924,398.

Lee, Charles A.; and Sorrells, Frank D., to International Paper Company. Rectangular disposable diaper having a contoured absorbent pad. 3,924,626, Cl. 128-287.000.

Lee, Charles A.; and Furbeck, Warren R., to International Paper Company. Method of and apparatus for bias laying. 3,925,142, Cl. 156-425.000.

Lee, Irvin J.: *See—*
Harris, Robert J.; and Lee, Irvin J., 3,924,562.

Lee, Vin-Jang, to University of Missouri, The Curators of the. Production of luminescence. 3,925,235, Cl. 252-188.3CL.

Leech, Edward J.: *See—*
Polichette, Joseph; Leech, Edward J.; and Nuzzi, Francis J., 3,925,578.

Lefebvre nee Bobkowicz, Margaret Mary: *See—*
Bobkowicz, Emilian; Bobkowicz, Andrew John; and Lefebvre nee Bobkowicz, Margaret Mary, 3,924,396.

Lefeuvre, Andre, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Sliding fitment for safety belt. 3,924,875, Cl. 280-150.0SB.

Lehmann, Gerard; and Brych, Alfred, to SAFT-Societe des Accumulateurs Fixes et de Traction. Electric primary cell in which the positive active material is silver chromate. 3,925,101, Cl. 136-100.00R.

Lehmann, Willi, to Westinghouse Electric Corporation. Halogen containing lead activated calcium sulfide luminescent composition. 3,925,240, Cl. 252-301.40S.

Leitman, Richard H.: *See—*
Kremer, Ross A.; and Leitman, Richard H., 3,925,519.

Lekim, Dac: *See—*
Betzing, Hans; and Lekim, Dac, 3,925,158.

Leland Stanford Jr. University, The Board of Trustees of: *See—*
Otto, Oberdan W., 3,925,653.

Le Martret, Odile: *See—*
Clemence, Francois; and Le Martret, Odile, 3,925,399.

Lemelson, Jerome H. Video transducing apparatus and method for editing. 3,925,815, Cl. 360-14.000.

Lemons, John B., to Mar, Bob. Container cap having safety lock means. 3,924,768, Cl. 215-213.000.

Lemont, Harold E., to Fairchild Industries, Inc. Reverse velocity rotor and rotorcraft. 3,924,965, Cl. 416-114.000.

Lendi, Ulrich, to Mageba, Firma. Car garage. 3,924,760, Cl. 214-16.1ED.

Leng, Barrie: *See—*
Moss, John Hickman; and Leng, Barrie, 3,925,531.

Lennon Manufacturing Inc.: *See—*
Gill, Clyde E., 3,924,377.

Lentine, Frank Nickolis; and Keller, William Francis, to Sybron Corporation. Root canal implement. 3,924,334, Cl. 32-57.000.

Leonard, George E., to Kartridg Pak Co., The. Apparatus for unscrambling and orienting overcaps. 3,924,732, Cl. 198-287.000.

Leonard, Joseph T., to United States of America, Navy. Thermally sensitive ink. 3,925,088, Cl. 106-20.000.

Leopold, Wilbur R., Jr.; Hackman, Frank C.; Luckenbill, Lawrence F.; and Ellis, Daniel A., to Mueller Co. Stab-type coupling joint. 3,924,877, Cl. 285-340.000.

Leschek, Walter C.; and McShane, James L., to Westinghouse Electric Corporation. Replaceable element ultrasonic flowmeter transducer. 3,925,692, Cl. 310-8.700.

Lesher, George Y.; and Brundage, Ruth Pauline, to Sterling Drug Inc. 3-Acetyl-1,4-dihydro-4-oxo-1,8-naphthyridines. 3,925,398, Cl. 260-296.00N.

Lester, George R., to Universal Oil Products Company. Production of hydrogen for use in coal liquefaction. 3,925,188, Cl. 208-8.000.

Lever Brothers Company: *See—*
Herstel, Henk; and van den Ouweland, Godefridus Antonius Maria, 3,925,561.
Lamberti, Vincent, 3,925,375.

Levine, Peter Alan, to RCA Corporation. Introduction of bias charge into a charge coupled image sensor. 3,925,657, Cl. 250-211.00J.

Lewandowski, Robert S.: *See—*
Woodbury, Henry H.; and Lewandowski, Robert S., 3,925,108.

Lewis, James M.; and Newyear, Raymond W., to Horizons Incorporated. Photoresist for holography and laser recording with bleachout dyes. 3,925,077, Cl. 96-35.100.

Lewis, Philip W.: *See—*
Bell, Richard L.; Walter, Richard T.; Botterman, David L.; and Lewis, Philip W., 3,924,736.

Lewis, Richard Newton, to SWS Silicones Corporation. Antistructure agent. 3,925,285, Cl. 260-29.1SB.

Leyton, Eric McPhail, deceased: *See—*
Fischbeck, Kenneth Henry; and Leyton, Eric McPhail, deceased, 3,924,974.

Leyton, Sheila, executrix: *See—*
Fischbeck, Kenneth Henry; and Leyton, Eric McPhail, deceased, 3,924,974.

Li, Tao P.; and Hobbs, Charles W., to Monsanto Company. Oxidation/ammoxidation catalyst. 3,925,255, Cl. 252-456.000.

Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Sonntag, Alois, 3,925,807.
Wiesenewsky, Karl-Heinz, 3,925,764.

Lieb, M. Johann. Measuring frame for a vehicle for controlling the geometrical characteristics of railway track. 3,924,460, Cl. 73-146.000.

Lievens, Ronald J.; and Kabat, Richard W., to Trane Company, The. Axial flow fan apparatus. 3,924,964, Cl. 415-210.000.

Lifeline Instruments, Inc.: *See—*
Lindsey, Homer M.; and Silva, Wilbert D., 3,924,700.

Liggero, Samuel H.: *See—*
Fielding, Herbert L.; and Liggero, Samuel H., 3,925,082.

Lin, Kingso Chingtsung, to Hooker Chemicals & Plastics Corporation. Methyl phosphine oxides as flame retardants for organic polymers. 3,925,265, Cl. 260-2.5AJ.

Lin, Yeong S., to International Business Machines Corporation. Gapless double-sided propagation structure for bubble domain devices. 3,925,768, Cl. 340-174.0TF.

Lindblad, Frederick Waldemar. Dental floss applicator. 3,924,647, Cl. 132-92.00R.

Lindblom, Karl Thore; and Forslund, Erik Torsten, to Ostbergs Fabriks AB. Stabilizing arrangement in terrain-going vehicles. 3,924,704, Cl. 180-41.000.

Linden, James C.: *See—*
Freytag, Arthur H.; and Linden, James C., 3,925,097.

Lindgren, Sune Gunnar: *See—*
Dahlbom, Johan Richard; Karlen, Bo Lennart; and Lindgren, Sune Gunnar, 3,925,411.

Lindner, Irmgard: *See—*
Obendorf, Werner; Lindner, Irmgard; Schwarzinger, Ernst; and Krieger, Josef, 3,925,412.

Lindquist, Claude S.: *See—*
Kerho, Stephen E.; Lindquist, Claude S.; White, John R.; and Breen, Bernard P., 3,924,442.

Lindqvist, Stig Gustaf Wilhelm: *See—*
Edstrom, Nils Herbert; Lindqvist, Stig Gustaf Wilhelm; and Sparrendahl, Gunnar Erik William, 3,925,620.

Lindsey, Homer M.; and Silva, Wilbert D., to Lifeline Instruments, Inc. Blood withdrawing device. 3,924,700, Cl. 177-118.000.

Lindsey, James C., to Cavalier Corporation. Adaptable article dispensing apparatus with cam actuating member. 3,924,779, Cl. 221-67.000.

Lineberry, Cletus E.: *See—*
Milholen, William F.; and Lineberry, Cletus E., 3,924,756.

Link, Gustav A.; and Boyden, Robert E., to Link, Gustav A. Automatic multiple station timing system. 3,925,683, Cl. 307-141.000.

Link, Joseph Edward: *See—*
Wagner, Joseph Francis; Broderick, Ross Thomas; Link, Joseph Edward; and Stover, David Emmert, 3,924,904.

Linke, Heinz: *See—*
Engel, Claus Richard; Linke, Heinz; Rothbuhr, Lothar; Sroka, Werner; Vogt, Jes; and Westlinning, Hermann, 3,925,301.

Linquist, Wayne; Pearson, Vernon W.; Hagemeyer, Kenneth; and Smeltzer, William E., to Greenlee Brothers and Co. Hydraulic cable bender. 3,924,438, Cl. 72-388.000.

Lint, Joseph J., to Electronor Corporation. Prevention of crevice corrosion. 3,925,185, Cl. 204-252.000.

Lion Fat & Oil Co., Ltd.: *See—*
Takenouchi, Kuniyoshi; Ohno, Norihiro; and Kondo, Fusao, 3,925,226.
Toyoda, Sadao; Ogoshi, Toshiaki; Maruyama, Minoru; and Miyawaki, Yozo, 3,925,441.

Litton Business Systems, Inc.: *See—*
Morelli, Joseph L., 3,924,727.

Livingston, Howard J.; and Esquenet, Bernard Etienne, to Chemclean Corporation. Hot forming lubricant composition, system and method. 3,925,214, Cl. 252-21.000.

Lizdas, Thomas E.; and Peterson, Bulow A., to United States Gypsum Company. Combination screw aligning and frame reinforcing brace. 3,924,373, Cl. 52-213.000.

LKB-Produkter AB: *See—*
Kindel, Erik Lennart, 3,924,500.

Loan, Leonard Donald: *See—*
Austin, James Raymond; Brown, Martin John; and Loan, Leonard Donald, 3,925,671.

Lob, Heinrich: *See—*
Bruning, Klaus; and Lob, Heinrich, 3,924,836.

Lockwood, Robert J.: *See—*
Carleton, Peter S.; Lockwood, Robert J.; and Reymore, Harold E., Jr., 3,925,284.

Loda, Gary K.: *See—*
Farrell, Sherman R.; and Loda, Gary K., 3,925,670.

Lofquist, Alden A., Jr. Metering pump. 3,924,973, Cl. 417-320.000.

Logothetis, Anestis Leonidas, to Du Pont de Nemours, E. I., and Company. Alternating copolymers of ethylene/alkyl acrylates/cure-site monomers and a process for their preparation. 3,925,326, Cl. 260-78.50R.

Lohrmann, Dieter R., to United States of America, Army. Diode quad modulator with very high dynamic range. 3,925,736, Cl. 332-43.00B.

Lohse, Friedrich: *See—*
Stockinger, Friedrich; and Lohse, Friedrich, 3,925,407.

Lois, Lambros. Apparatus for extracting energy from winds at significant height above the surface. 3,924,827, Cl. 244-153.00R.

Lonati, Francesco. Method and machine for manufacturing stockings. 3,924,423, Cl. 66-43.000.

Long Mile Rubber Company: *See—*
Blankenship, James O., 3,925,129.

L'Oreal: *See—*
Kalopissis, Gregoire; Bugaut, Andree; and Zorayan, Vahan, 3,925,474.

Lorenz, Achim R., to MacMillan Bloedel Containers, Inc. Corrugated lamp bulb wrapper. 3,924,799, Cl. 229-39.00B.

Louie, Ming H., to Honeywell Information Systems Inc. Parity predicting and checking logic for carry look-ahead binary adder. 3,925,647, Cl. 235-153.0BB.

Lousberg, Pierre Jean Simon: *See—*
Dechambre, Jean Theophile Fortunat; Lousberg, Pierre Jean Simon; and Pirard, Joseph Jean Julien, 3,924,499.

Love, Robert B.: *See—*
Kent, John Allen; Love, Robert B.; and Meyer, Harold Louis, 3,924,909.

Loveless, Frederick C., to Uniroyal, Inc. Metallation of polymers and subsequent reaction to form modified or grafted polymers. 3,925,511, Cl. 260-877.000.

Lowe, William F.; and Bondy, Harry L., to E-Z Machine Corporation. Apparatus for applying reinforcement zones to sheet material. 3,925,144, Cl. 156-518.000.

Loyd, Robert William, Jr.; and Wallace, Raymond P., to Curtiss-Wright Corporation. Coupling means for a sectional drive shaft of a rotary mechanism. 3,924,978, Cl. 418-60.000.

Lozano, Jose Antonio Fernandez. Treatment of seawater brines with an alcohol to recover a fertilizer quality double salt. 3,925,028, Cl. 23-298.000.

Lucas Aerospace Limited: *See—*
Dabrowka, Stanislav Pawel, 3,924,708.

Lucas, David F. Auxiliary emergency warning light system. 3,925,759, Cl. 340-81.00R.

Lucas Electrical Company Limited: *See—*
Holt, William David, 3,925,758.

Luckenbill, Lawrence F.: *See—*
Leopold, Wilbur R., Jr.; Hackman, Frank C.; Luckenbill, Lawrence F.; and Ellis, Daniel A., 3,924,877.

Ludin, Ludwig, to Camille Bauer Messinstrumente AG. Printer. 3,924,528, Cl. 101-93.150.

Luebkeman, Geroge C. Throwing arm latch for spring target traps. 3,924,600, Cl. 124-36.000.

Lummus Company, The: *See—*
Gelbein, Abraham P., 3,925,447.

Lundberg, Robert D.; and Makowski, Henry S., to Exxon Research & Engineering Company. Fabrication multiphase plastics from liquid suspension. 3,925,280, Cl. 260-23.00R.

Lundberg, Robert Dean: *See—*
Koleske, Joseph Victor; Whitworth, Clyde Jesse, Jr.; and Lundberg, Robert Dean, 3,925,504.

Lynex, Graham; and Tranter, Harold, to British Industrial Plastics Limited. Shut-off valves for the nozzles of injection moulding machines. 3,924,811, Cl. 239-533.000.

Lyons, Theodore F.: *See—*
Kuhn, Robert F.; Lyons, Theodore F.; and Raider, Jerry W., 3,924,725.

Lyons, William E.: *See—*
Matrone, John L.; and Lyons, William E., 3,925,043.

M. C. Guarino Associates, Inc.: *See—*
Guarino, Michael C.; and Cacossa, Frank, 3,924,369.

Macartney, Earle M.: *See—*
Werner, Arthur W., 3,924,547.

Macartney, Marjorie: *See—*
Werner, Arthur W., 3,924,547.

Maccherone, Lawrence: *See—*
D'Angelo, Joseph; Maccherone, Lawrence; and Maros, Frank George, 3,924,497.

MacDonald, Alan A., to Stauffer Chemical Company. Certain alkyloxalyl amino substituted s-triazines herbicides. 3,925,055, Cl. 71-93.000.

MacDonnell, Robert W.; and Shander, Otto A., to R. W. Mac Company. Side frame key assembly. 3,924,541, Cl. 105-221.00K.
Mac Donnell, Robert W.; and Shander, Otto A., to R. W. Mac Company. Railway bolster re-enforcement system. 3,924,542, Cl. 105-226.000.
Mackowiak, Leonard S.: *See—*
Petersen, Arthur, Sr.; Mackowiak, Leonard S.; and Schoenholz, Daniel, 3,925,112.
MacMillan Bloedel Containers, Inc.: *See—*
Lorenz, Achim R., 3,924,799.
Madelaine, Serge: *See—*
Belliot, Christian; Cheylan, Etienne; Madelaine, Serge; and Ebbing, Johannes, 3,925,535.
Madonia, Anthony F. Article pick-up and transfer apparatus. 3,924,759, Cl. 214-8.50D.
Maeda, Mitsuo: *See—*
Yoshino, Masataka; Kuwazawa, Hiroyasu; Shimojima, Haruhiko; Tanaka, Osamu; Kusakawa, Hideaki; Matsuoka, Hiromasa; and Maeda, Mitsuo, 3,925,021.
Magder, Jules; and Reich, Murray H., to Princeton Chemical Research, Inc. Embossed packaging material. 3,925,302, Cl. 260-42.460.
Mageba, Firma: *See—*
Lendi, Ulrich, 3,924,760.
Magnani, Eugenio, to Fidenza Vetraria S.p.A. Airtight container cap. 3,924,772, Cl. 215-276.000.
Mahan, Robert E.: *See—*
Richardson, Richard L.; Hildebrand, Bernard P.; and Mahan, Robert E., 3,925,646.
Maier, Ludwig, to Monsanto Company. Halovinylene- 1,2-bis(phosphonic acids and esters)and process for their preparation. 3,925,455, Cl. 260-502.40P.
Maki, Kentaro: *See—*
Ogawa, Hiroshi; Nitta, Kazuo; Nakazawa, Nobuhiko; and Maki, Kentaro, 3,925,020.
Makino, Syoso; Hosokawa, Kenjiro; and Sano, Junzi, to Kanebo, Ltd. Method for simultaneously scouring and bleaching materials consisting of textile fibers. 3,925,008, Cl. 8-111.000.
Makowski, Henry S.: *See—*
Lundberg, Robert D.; and Makowski, Henry S., 3,925,280.
Malagari, Frank A.: *See—*
Salsgiver, James A.; and Malagari, Frank A., 3,925,115.
Mallinckrodt, Inc.: *See—*
Ogawa, Hiroshi; Nitta, Kazuo; Nakazawa, Nobuhiko; and Maki, Kentaro, 3,925,020.
Mallon, Joseph R.: *See—*
Kurtz, Anthony D.; Brosh, Amnon; Gravel, Charles L.; and Mallon, Joseph R., 3,924,322.
Maly, George P.; and Tannahill, Clifton A., to Union Oil Company of California. Pile for use in offshore areas having a shifting layer of mud. 3,924,414, Cl. 61-53.000.
Mancusi, Joseph J., Jr., to Altair, Inc. Magnetic clamp. 3,924,631, Cl. 128-346.000.
Mang, Josef: *See—*
Dehne, Wilfried E.; and Mang, Josef, 3,924,421.
Mangold, Dietrich: *See—*
Fischer, Adolf; Hamprecht, Gerhard; Mangold, Dietrich; and Rohr, Wolfgang, 3,925,439.
Mann, Gilbert E. Tension reliever. 3,924,638, Cl. 128-359.000.
Manning, Robert Everett: *See—*
Buzzolini, Mario Gustav; and Manning, Robert Everett, 3,925,483.
Manor, Gedalyahu, to Technion Research and Development Foundation, Ltd.; and Kipnis, Aharon. Hydraulically controlled grader-leveler adapted for trailing by tractors. 3,924,689, Cl. 172-780.000.
Mantione, Anthony F., to Bethlehem Steel Corporation. Coke quench car. 3,924,543, Cl. 105-257.000.
Mar, Bob: *See—*
Lemons, John B., 3,924,768.
Marchetti, Enzo, to Instituto Farmacologico Serono S.p.A. Carboxylic acid amide and hydrazide derivatives of 4,5-diphenyloxazole and process for preparing them. 3,925,404, Cl. 260-307.00R.
Marechal, Robert Gaston Andre; and Fortunato, Gerard, to Etablissement Public: Agence Nationale de Valorisation de la Recherche (ANVAR). Arrangement and method for studying radiation by interferential spectrometry. 3,924,952, Cl. 356-106.00S.
Marino, Patrick John: *See—*
Cardwell, Robert Edward; Davis, Robert Leon; Marino, Patrick John; and McNamara, Edward Joseph, 3,925,600.
Marion Health and Safety, Inc.: *See—*
Avery, Carl Frederick, 3,924,623.
Markovitch, Branko, to Simmons, Samuel P. Safety latch. 3,924,885, Cl. 292-262.000.
Markovitch, Branko, to Simmons, Samuel P. Sliding link safety latch. 3,924,886, Cl. 292-263.000.
Markovitch, Branko, to Simmons, Samuel P. Pivoting link safety latch. 3,924,887, Cl. 292-283.000.
Marlboro Manufacturing Inc.: *See—*
Cain, James F., 3,924,293.
Marley Company, The: *See—*
Cates, Robert E., 3,925,523.
Maros, Frank George: *See—*
D'Angelo, Joseph; Maccherone, Lawrence; and Maros, Frank George, 3,924,497.
Marsh, Paul G., to Black Clawson Company, The. Selective reclamation of waste paper products. 3,925,150, Cl. 162-4.000.
Marsh, Richard O., Jr. Fittings and the like for pipe piling. 3,924,413, Cl. 61-53.000.
Marsh Stencil Machine Company: *See—*
Hill, Forrest G., 3,924,498.
Marshall, John: *See—*
Robertson, Malcolm Eric Alexander; Marshall, John; Brabants, Jules Anthony Peter; and Davies, Michael Edward, 3,925,665.
Marshall, Robert Moore; and Dardoufas, Kimon Constantine, to Allied Chemical Corporation. Production of polyester yarn. 3,925,588, Cl. 428-395.000.
Marsili, Leonardo; and Pasqualucci, Carmine, to Archivar Industrie Chimiche del Trentino S.p.A. 1,3-Oxazino(5,6-c)rifamycins and method for preparing the same. 3,925,366, Cl. 260-239.30P.
Marsland Engineering Limited: *See—*
Showalter, Lane Crawford; Brokenshire, John Leslie; and Watts, Geoffrey Brian, 3,925,022.
Martin, Gerhard: *See—*
Berthmann, Adolf; Martin, Gerhard; and Klunsch, Maximilian, 3,925,122.
Martin, Keith Fraser, to F. B. Mercer Limited. Commodity packaging. 3,924,522, Cl. 93-84.0TW.
Martin, Paul Warren, to Dresser Industries, Inc. Stop collar for tube expander. 3,924,433, Cl. 72-122.000.
Martyn, Viktor Mikhailovich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Chekotilo, Leonty Vasilievich; Martyn, Viktor Mikhailovich; Artamonov, Viktor Leonidovich; Bochorishvili, Anzor Ippolitovich; Stupak, Leonid Mikhailovich; Sysenko, Anatoly Petrovich; and Popov, Valery Georgievich, 3,924,672.
Maruyama, Isamu; Nakao, Masaru; Sasajima, Kikuo; Ono, Keiichi; Takayama, Masaharu; Katayama, Shigenari; Tanaka, Yoshihiro; Yanagihara, Izumi; Inaba, Shigeho; and Yamamoto, Hisao, to Sumitomo Chemical Company, Ltd. 1-[γ-o-Amino-p-halophenyl-oxy, thio or sulfinyl)-propyl]-4-(alkoxy or halo phenyl)piperazines. 3,925,387, Cl. 260-268.0PH.
Maruyama, Isamu: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,925,364.
Maruyama, Minoru: *See—*
Toyoda, Sadao; Ogoshi, Toshiaki; Maruyama, Minoru; and Miyawaki, Yozo, 3,925,441.
Marvin Glass & Associates: *See—*
Terzian, Rouben T., 3,924,351.
Maschinenfabrik Augsburg-Nurnberg A.G.: *See—*
Klingler, Friedrich, 3,924,531.
Maschinenfabrik Hennecke GmbH: *See—*
Althausen, Ferdinand; Boden, Heinrich; Ersfeld, Heinz; Klier, Lothar; Raffel, Reiner; and Schneider, Walter, 3,924,989.
Maschke, Erich: *See—*
Jargon, Franz; Maschke, Erich; and Eylens, Rudolf, 3,925,171.
Mason, Samuel J.; Troxel, Donald E.; and Schreiber, William F., to ECRM, Inc. Method of and apparatus for optical character recognition, reading and reproduction. 3,925,760, Cl. 340-146.3ED.
Massey-Ferguson-Perkins Limited: *See—*
Ward, Frederick H., deceased, 3,924,783.
Massey-Ferguson Services N.V.: *See—*
Quick, Donald Jonathon, 3,925,199.
Masters, Burton J.: *See—*
Ku, San-Mei; and Masters, Burton J., 3,925,106.
Masui, Hiroaki: *See—*
Takechi, Hiroshi; Kawano, Tsuyoshi; Hashizume, Toshio; Koyama, Kazuo; and Masui, Hiroaki, 3,925,111.
Mathis, Ronald J.: *See—*
Colburn, John W., Jr.; Wood, Charles D., III; Mathis, Ronald J.; and Nye, Allan R., 3,924,897.
Matlock, Thomas D.; and Smith, Kenneth R., to Westinghouse Electric Corporation. Tube pushing apparatus. 3,924,316, Cl. 29-202.00R.
Matrone, John L.; and Lyons, William E., to Environment/One Corporation. Low cost, efficient, general purpose air cleaner cartridge. 3,925,043, Cl. 55-276.000.
Matsuda, Ryoichi: *See—*
Kato, Kunihiro; Matsuda, Ryoichi; and Okayasu, Ryoichi, 3,925,618.
Matsugu, Tomoyuki: *See—*
Matsuo, Kazuto; Araki, Michiya; Matsugu, Tomoyuki; and Mikami, Takahito, 3,925,290.
Matsui, Hiroshi: *See—*
Enei, Hitoshi; Matsui, Hiroshi; and Hirose, Yoshio, 3,925,154.
Matsui, Kazumi; Umemori, Takashi; Matsuura, Kenji; Hosoda, Yoshikado; Nishikawa, Tadashige; and Tawara, Makoto, to Japanese National Railways; Sumitomo Electric Industries, Ltd.; and Furukawa Electric Co., Ltd. Electromagnetic rails for driving trains by thyristor-controlled linear motors. 3,924,537, Cl. 104-148.0LM.
Matsumura, Isao; and Kohayakawa, Yoshimi, to Canon Kabushiki Kaisha. Eye fundus camera with focus setting device. 3,925,793, Cl. 354-62.000.
Matsumura, Yasuo; and Takeuchi, Shoichi, to Japan Exlan Company Limited. Aqueous acrylonitrile polymer solution containing thiocyanate and amide compound. 3,925,291, Cl. 260-29.6AN.
Matsuo, Kazuto; Araki, Michiya; Matsugu, Tomoyuki; and Mikami, Takahito, to Kohjin Co., Ltd. Emulsions useful in the preparation of heat resistant fibers and films. 3,925,290, Cl. 260-29.6WB.
Matsuoka, Hiromasa: *See—*
Yoshino, Masataka; Kuwazawa, Hiroyasu; Shimojima, Haruhiko; Tanaka, Osamu; Kusakawa, Hideaki; Matsuoka, Hiromasa; and Maeda, Mitsuo, 3,925,021.

Matsushita Electric Industrial Co., Ltd.: *See—*
Minami, Shunji; Oka, Shunzo; and Takemura, Takehide, 3,925,720.
Nagasawa, Mashahiro; Watanabe, Hiroyuki; and Wakabayashi, Takashi, 3,925,244.
Matsuura, Kenji: *See—*
Matsui, Kazumi; Umemori, Takashi; Matsuura, Kenji; Hosoda, Yoshikado; Nishikawa, Tadashige; and Tawara, Makoto, 3,924,537.
Matteo, John F.: *See—*
Duranleau, Roger G.; and Matteo, John F., 3,925,431.
Mattis, Donald J., to Sun Chemical Corporation. Composite map light and cigar lighter plug. 3,925,655, Cl. 240-2.0CL.
Maurel, Felix: *See—*
Brunie, Jean-Claude; Creene, Noel; and Maurel, Felix, 3,925,316.
Maurice, Louis, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Molecular pumps of the drum type. 3,924,962, Cl. 415-90.000.
Maus, Otfrid, to Carl Schenck AG, Firma. Balancing apparatus, especially wheel balancing apparatus. 3,924,473, Cl. 73-471.000.
Maxey, Edwin Morgan: *See—*
Fabris, Hubert Jakob; and Maxey, Edwin Morgan, 3,925,266.
Maxwell, Paul E., to Multiple Originals, Inc. Stencil casting process and resulting architectural art product. 3,925,586, Cl. 428-195.000.
May, Eric R., to Stone Manganese Marine Limited. Oil-supply means for runner hubs with controllable pitch blades. 3,924,411, Cl. 60-486.000.
Maya, Gregory: *See—*
Crooks, Russell W.; and Maya, Gregory, 3,924,995.
Mayer, Ivan: *See—*
Parker, Paul T.; and Mayer, Ivan, 3,925,318.
Mayo, Frederick W., to N.R.G. Equipment Corporation. Combustible gas system and method. 3,925,033, Cl. 48-144.000.
Mazur, Abraham, to Community Blood Council of Greater New York, Inc., The. Plasma protein substitute. 3,925,344, Cl. 260-112.500.
McAleer, Howard J., to Formax Manufacturing Corporation. Sanding pad assembly. 3,924,362, Cl. 51-358.000.
McAllister, Ian R.: *See—*
Bennett, John A.; and McAllister, Ian R., 3,924,412.
McCaffrey, Michael Thomas: *See—*
Goldmacher, Joel Edward; and McCaffrey, Michael Thomas, 3,925,236.
McCarthy, William J., to B. F. Goodrich Company, The. Castable compositions containing unsaturated liquid vinylidene-terminated polymers. 3,925,330, Cl. 260-78.50B.
McCaully, Ronald J.: *See—*
Wei, Peter H. L.; and McCaully, Ronald J., 3,925,370.
McClain, James E., to Esco Manufacturing Company. Disconnectable electrical connector. 3,924,919, Cl. 339-60.00C.
McCormick, Mathew, to Bowthorpe Hellermann Limited. Cable ties. 3,924,299, Cl. 24-16.0PB.
McCullough, John E., to Arthur D. Little, Inc. Positive fluid displacement apparatus. 3,924,977, Cl. 418-55.000.
McDonnell Douglas Corporation: *See—*
Connors, William P., 3,925,658.
McDowell, Donald J.: *See—*
Czernik, Daniel E.; and McDowell, Donald J., 3,924,907.
McElroy, Jerry T.; and Soloway, Sidney, to Automation Industries, Inc. Multi-frequency ultrasonic testing system. 3,924,454, Cl. 73-67.80R.
McGinniss, Vincent D., to SCM Corporation. Cathodic electrocoating process. 3,925,181, Cl. 204-181.000.
McGraw-Hill, Inc.: *See—*
Smith, Elliott P.; Wachsmuth, Robert H.; and Skolnick, Leonard, 3,924,941.
McKenzie, Ian, to Clark Equipment Company. Compact tree clamp and automatic sequence control for a tree length harvester. 3,924,667, Cl. 144-3.00D.
McKim, Elvin. Corrective device for clubfoot. 3,924,615, Cl. 128-80.00J.
McKnight, Robert J.: *See—*
Gotham, Robert W.; and McKnight, Robert J., 3,924,908.
McLaughlin, Charles R.; and West, Jerry B., to Western Company of North America, The. Asynthronous pulse telemetry system and method. 3,925,749, Cl. 340-18.00P.
McMenim, Michael Edward, to Imperial Chemical Industries Limited. Carboxamides. 3,925,440, Cl. 260-457.000.
McNamara, Edward Joseph: *See—*
Cardwell, Robert Edward; Davis, Robert Leon; Marino, Patrick John; and McNamara, Edward Joseph, 3,925,600.
Cardwell, Robert Edward; Carlson, David Emory; Davis, Robert Leon; McNamara, Edward Joseph; Pilc, Randolph John; Schlanger, Gabriel Gary; Tutelman, David Morris; Warwick, Peter Stephen; and Zydney, Herbert Mortimer, 3,925,601.
McNeil Laboratories, Incorporated: *See—*
Rasmussen, Chris Royce, 3,925,371.
McNutt, Reginald: *See—*
Beacham, Ronald; Covington, Dennis; and McNutt, Reginald, 3,925,770.
Mc Shane, Herbert Felix, Jr., to Du Pont de Nemours, E. I., and Company. Process for preparing ethylene/propylene/1,4-hexadiene elastomeric terpolymers using catalyst prepared in a wiped-wall catalyst premixer. 3,925,334, Cl. 260-80.780.
McShane, James L.: *See—*
Leschek, Walter C.; and McShane, James L., 3,925,692.
McWhorter, Daniel M.: *See—*
Taylor, Glenn M.; Patel, Harish A.; and McWhorter, Daniel M., 3,924,634.
Mead Corporation, The: *See—*
Wood, Prentice J., 3,924,740.
Mead Johnson & Company: *See—*
Brooke, Dana, 3,924,622.
Meadows, Roger D., to Dayco Corporation. Endless power transmission belt and method of making same. 3,924,482, Cl. 74-234.000.
Medlar, Lewis A., to Honeywell Inc. Magnetic flowmeter with improved field coil. 3,924,466, Cl. 73-194.0EM.
Medovar, Boris Izrailevich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Chekotilo, Leonty Vasilievich; Martyn, Viktor Mikhailovich; Artamonov, Viktor Leonidovich; Bochorishvili, Anzor Ippolitovich; Stupak, Leonid Mikhailovich; Sysenko, Anatoly Petrovich; and Popov, Valery Georgievich, 3,924,672.
Medtronic, Inc.: *See—*
King, Wendell L., 3,924,640.
Meeks, James O. Apparatus for restoring cans to upright positions. 3,924,731, Cl. 198-268.000.
Mehn, Robert P.: *See—*
Classe, Anthony V.; and Mehn, Robert P., 3,924,572.
Mehnert, Gottfried. Articulated mold opening and closing means for use in blow molding apparatus. 3,924,987, Cl. 425-451.500.
Meininger, Fritz; Hoyer, Ernst; and Fuchs, Hermann, to Hoechst Aktiengesellschaft. Water-soluble reactive monoazodyestuffs. 3,925,351, Cl. 260-196.000.
Meister, Rene; and Tyrode, Alain, to Ebauches S.A.; and Faubourg de l'Hospital. Mounting device for a quartz resonator. 3,925,693, Cl. 310-9.100.
Melcher, Robert Albert, to Schloemann-Siemag Aktiengesellshaft. Injection molding apparatus. 3,924,991, Cl. 425-190.000.
Memphis Metal Manufacturing Company, Inc.: *See—*
Yarnold, Daniel J., 3,924,432.
Menasco Manufacturing Company: *See—*
Kendall, Giles A.; Bhutani, Harish K.; and Minick, Robert, 3,924,511.
Menissez, Jean Pierre: *See—*
Vaillant, Christian; and Menissez, Jean Pierre, 3,924,876.
Menzer, Anton: *See—*
Eberhard, Heinz; and Menzer, Anton, 3,924,518.
Merck & Co., Inc.: *See—*
Cama, Lovji D., 3,925,363.
Wendler, Norman L.; and Taub, David, 3,925,419.
Merck Patent Gesellschaft mit beschrankter Haftung: *See—*
Dahm, Johann; Borck, Joachim; Nowak, Herbert; Zimane, Zdenek; and Kayser, Detlev, 3,925,394.
Merrill, Duane F., to General Electric Company. Organopolysiloxane release resins useful in cooking and baking processes. 3,925,276, Cl. 260-18.00S.
Merser, Francis Gerard, to Dennison Manufacturing Company. Attachment and mounting construction. 3,924,298, Cl. 24-16.0PB.
Merstallinger, Kurt; and Schindl, Klaus P., to C. Reichert Optische Werke, AG. Polarizing attachment for microscopes having inclined binocular eyepiece. 3,924,926, Cl. 350-34.000.
Mesenbring, Miles H. Skid for transporting sheet material. 3,924,871, Cl. 280-12.00R.
Meshri, Dayal T.; and Westfall, Darrell L., to Ozark-Mahoning Company. Processes of synthesizing anhydrous lithium hexafluoroarsenate. 3,925,539, Cl. 423-464.000.
Messer Griesheim G.m.b.H.: *See—*
Schmidt, Jurgen; and Hesse, Jurgen, 3,924,357.
Messerschmitt-Bolkow-Blohm G.m.b.H.: *See—*
Peschke, Reiner, 3,924,825.
Metalogic, Inc.: *See—*
Johnson, Robert C., 3,924,343.
Metlesics, Werner; and Sternbach, Leo Henryk, to Hoffmann-La Roche Inc. Novel 2[2-(1,3-diazacycloalk-2-enyl)]benzophenone derivatives and novel 1,3-diazacycloalkenyl[2,1-1]isoindole derivatives. 3,925,359, Cl. 260-239.0BC.
Meyer, Edward P.; and Wright, William L., to Picker Electronics, Inc. Sector scanning ultrasonic inspection apparatus. 3,924,452, Cl. 73-67.80S.
Meyer, Frank A. Bale accumulator. 3,924,757, Cl. 214-6.00B.
Meyer, Harold Louis: *See—*
Kent, John Allen; Love, Robert B.; and Meyer, Harold Louis, 3,924,909.
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, to Bayer Aktiengesellschaft. 4-Aryl-6-amino-3,4-dihydropyrid-2-one-3,5-dicarboxylic acid ester. 3,925,395, Cl. 260-294.80G.
Meyer, Rudolf; and Ranz, Erwin, to Agfa-Gevaert Aktiengesellschaft. Method of and apparatus for producing enlarged reproductions of vesicular image negatives. 3,924,946, Cl. 355-18.000.
Meyer, Willy: *See—*
Pissiotas, Georg; Meyer, Willy; Bohner, Beat; and Drabek, Jozef, 3,925,517.
Meyerhans, Konrad: *See—*
Ernst, Otto; Meyerhans, Konrad; and Kusenberg, Eugen, 3,924,737.
Mikami, Kenji: *See—*
Ukaji, Rokuo; Kamihigoshi, Tutomu; Mikami, Kenji; and Takaki, Shoji, 3,925,263.
Ukaji, Rokuo; Kamihigoshi, Tutomu; Mikami, Kenji; and Takaki, Shoji, 3,925,492.

Mikami, Takahito: *See—*
Matsuo, Kazuto; Araki, Michiya; Matsugu, Tomoyuki; and Mikami, Takahito, 3,925,290.
Mikazhans, Valdis Danielovich: *See—*
Formale, Milda Yanovna; Kashkina, Nadezhda Alexandrovna; Veinberg, Elfrida Indrikovna; Kalninsh, Arvid Yanovich; Shusters, Janis; Mikazhans, Valdis Danielovich; Purvinsh, Indulis Valdovich; and Skutelis, Antons Petrovich, 3,925,356.
Mikoflavy, Bela K.: *See—*
Knechtges, Donald P.; and Mikoflavy, Bela K., 3,925,293.
Miles Laboratories, Inc.: *See—*
Chang, Lung Ting; and Terry, Carol Ann, 3,925,156.
Milholen, William F.; and Lineberry, Cletus E., to Forrest Paschal Machinery Co. Apparatus for stacking bricks in preparation for strapping. 3,924,756, Cl. 214-6.00A.
Millauer, Christian, to Werner & Pfleiderer. Continuously operating screw conveyor. 3,924,839, Cl. 259-191.000.
Millben, Lawrence A., to Burroughs Corporation. System for simulating switch contact bounce. 3,925,723, Cl. 324-28.0CH.
Miller, Douglas E., to Minnesota Mining and Manufacturing Company. Cleaning brush. 3,924,286, Cl. 15-114.000.
Miller, Frank S.: *See—*
Tu, Peter K. C.; Brooke, Alan H.; and Miller, Frank S., 3,925,044.
Miller, Homer W., to Honeywell Information Systems Inc. Current mode arithmetic logic array. 3,925,651, Cl. 235-175.000.
Miller, Homer W., to Honeywell Information Systems Inc. Current mode carry look-ahead array. 3,925,652, Cl. 235-175.000.
Miller, James G.: *See—*
Heyman, Joseph S.; and Miller, James G., 3,924,444.
Miller, James S.: *See—*
Hilger, Edwin T.; and Miller, James S., 3,924,300.
Miller, Lowell E.; and Nielsen, Gail R., to Com Tel, Inc. A.C. power supply circuit in combination with an A.C. source and a D.C. source. 3,925,772, Cl. 340-253.00C.
Millet Roux & Cie., Ltee.: *See—*
Volper, Jean, 3,924,374.
Mills, Ivor W., to Sun Oil Company of Pennsylvania. Process of comprising solvent extraction of a blended oil. 3,925,220, Cl. 252-63.000.
Mills, Ned D. Variable ratio drive unit and method. 3,924,490, Cl. 74-752.00E.
Minakawa, Yoshinari; and Sashida, Akinobu, to Eiki Industrial Co., Ltd. Guiding device for an automatic film loader. 3,924,821, Cl. 242-195.000.
Minami, Shunji; Oka, Shunzo; and Takemura, Takehide, to Matsushita Electric Industrial Co., Ltd. Device for varying output voltage within a limited range. 3,925,720, Cl. 323-22.0SC.
Minderhout, James R.: *See—*
Baimbridge, Charles L.; Minderhout, James R.; Bearman, Robert W.; and Carpenter, Donald E., 3,925,169.
Minick, Robert: *See—*
Kendall, Giles A.; Bhutani, Harish K.; and Minick, Robert, 3,924,511.
Minieri, Pasquale P., to Tenneco Chemicals, Inc. Surface-coating compositions containing N-(indazolyl-N^1-methyl)dialkanolamines. 3,925,304, Cl. 260-45.80N.
Minnesota Mining and Manufacturing Company: *See—*
Baldassarri, Agostino; and Cellone, Luigi, 3,925,086.
Fisch, Richard S.; and Newman, Norman, 3,925,175.
Holmen, Reynold E.; and Nellessen, Alfred H., 3,924,929.
Miller, Douglas E., 3,924,286.
Olsen, Keith H.; and Christmann, Marvin H., 3,925,146.
Primicerio, Fernando; and Benigno, Paolo, 3,924,742.
Strong, Doyle L., 3,925,219.
Mintz, Charlotte: *See—*
Gaffney, William, 3,924,802.
Misiura, Thaddeus Dominick; Vostovich, Joseph Edward; and Wahl, Ralph Edward, to General Electric Company. Electrical conductors with strippable insulation and method of making the same. 3,925,597, Cl. 174-102.0SC.
Misonoo, Kazunaga, to Kozo Yoshizaki. Method and apparatus for forming cup-shaped metal articles. 3,924,436, Cl. 72-345.000.
Mitchell, James T.; and Billings, William W., to Westinghouse Electric Corporation. Overcurrent protection circuit for AC systems. 3,925,709, Cl. 317-33.0VR.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Watanabe, Jinzo; Terao, Noboru; Kamahara, Koichi; Miyashita, Kazuhisa; and Fujihira, Kenji, 3,925,802.
Yamamoto, Takeshi, 3,925,179.
Yoshino, Masataka; Kuwazawa, Hiroyasu; Shimojima, Haruhiko; Tanaka, Osamu; Kusakawa, Hideaki; Matsuoka, Hiromasa; and Maeda, Mitsuo, 3,925,021.
Mitsubishi Kinzoku Kabushiki Kaisha: *See—*
Fukushima, Seitaro; and Kawahara, Kiyoshi, 3,925,057.
Mitsubishi Rayon Co., Ltd.: *See—*
Ide, Fumio; Kishida, Kazuo; and Hasegawa, Akira, 3,925,510.
Mitsugi, Takashi: *See—*
Kondo, Eiji; Mitsugi, Takashi; and Muneyuki, Ryonosuke, 3,925,155.
Mitsuhashi, Shigeru; Hirokawa, Kyoichi; Saito, Noboru; Kaneko, Minoru; Shoji, Michihiro; Kowada, Masunari; and Kazama, Yasuo, to Nitto Kohki Co., Ltd. Hydraulically operated working machine. 3,924,330, Cl. 30-362.000.
Mitsui, Kazuhiko, to Olympus Optical Co., Ltd. Endoscope. 3,924,608, Cl. 128-2.00B.
Mitsui Mining & Smelting Co., Ltd.: *See—*
Izumi, Sumio; and Tanaka, Hiroshi, 3,925,200.
Mitsushima, Hirotsugu; and Katata, Motohiro, to Sumitomo Chemical Company, Limited. Method for producing vinyl acetate-ethylenedicarboxylic acid diallyl ester copolymer. 3,925,327, Cl. 260-78.5UA.
Miura, Minoru; Kawasaki, Morio; Sasaki, Kantaro; Sugitani, Yasuo; and Ishimura, Susumu, to Sumitomo Metal Industries, Ltd. Apparatus for supporting and guiding slab in the secondary cooling zone of continuous casting machine. 3,924,812, Cl. 239-550.000.
Miyake, Makoto: *See—*
Akamatsu, Takashi; Koga, Koichi; Kondo, Mitsuru; Miyake, Makoto; and Iwasaki, Hiroshi, 3,925,416.
Miyaki, Kiyoshi; and Kogure, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. Intake arrangement of an internal combustion engine. 3,924,590, Cl. 123-122.0AB.
Miyaki, Kiyoshi; and Kogure, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. Intake system for three-valve internal combustion engine. 3,924,592, Cl. 123-122.0AB.
Miyaki, Kiyoshi: *See—*
Yagi, Shizuo; Miyaki, Kiyoshi; and Kogure, Hiroshi, 3,924,582.
Miyashita, Kazuhisa: *See—*
Watanabe, Jinzo; Terao, Noboru; Kamahara, Koichi; Miyashita, Kazuhisa; and Fujihira, Kenji, 3,925,802.
Miyawaki, Yozo: *See—*
Toyoda, Sadao; Ogoshi, Toshiaki; Maruyama, Minoru; and Miyawaki, Yozo, 3,925,441.
Miyoshi, Hiroshi; Mori, Hirohumi; and Tanoue, Yoriko, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Photo-degrading resinous composition. 3,925,269, Cl. 260-2.50B.
Mizuno, Masayuki: *See—*
Shimojima, Yukiji; Takeda, Isao, deceased; Takeda, Emiko, legal representative; Mizuno, Masayuki; Mizuno, Yukiko; and Ohoka, Tadaaki, 3,925,546.
Mizuno, Yukiko: *See—*
Shimojima, Yukiji; Takeda, Isao, deceased; Takeda, Emiko, legal representative; Mizuno, Masayuki; Mizuno, Yukiko; and Ohoka, Tadaaki, 3,925,546.
Mobil Oil Corporation: *See—*
Burgess, William P., 3,925,191.
Heiba, EL-Ahmadi Ibrahim; and Williams, Albert Lloyd, 3,925,232.
Kremer, Ross A.; and Leitman, Richard H., 3,925,519.
Landis, Phillip S.; and Okorodudu, Abraham O. M., 3,925,414.
Rodewald, Paul G.; and Whitehurst, Darrell D., 3,925,194.
Rodewald, Paul G.; and Whitehurst, Darrell D., 3,925,251.
Rodewald, Paul G., 3,925,495.
Model Builders, Inc.: *See—*
Cohen, Morris; Cohen, Evelyn V.; and Rubio, Alfred M., 3,924,501.
Moeller, Wolfgang W. Staple gun. 3,924,790, Cl. 227-148.000.
Moessner, Manfred; and Kreutze, Gerhard, to Badische Anilin- & Soda-Fabrik Aktiengellschaft. Cartridge for recording media. 3,924,822, Cl. 242-198.000.
Mogilevsky, Vitaly Moritsovich; Deriga, Nikolai Filippovich; Ekimov, Vadim Petrovich; Erastov, Alexandr Petrovich; Posokhin, Viktor Vladimirovich; and Furer, Benya Elievich. Oscilloscopic ferrometer. 3,925,725, Cl. 324-34.00R.
Mohsen, Amr Mohamed, to Bell Telephone Labratories, Incorporated. Method of fabricating stepped electrodes. 3,924,319, Cl. 29-578.000.
Molex Incorporated: *See—*
Kufner, Kenneth L., 3,924,325.
Moller, Hermann: *See—*
Andres, Rudolf; Moller, Hermann; and Seyfried, Franz, 3,925,656.
Mollering, Hans: *See—*
Beaucamp, Klaus; Mollering, Hans; Lang, Gunter; Gruber, Wolfgang; and Roeschlau, Peter, 3,925,164.
Mollet, Prudent Eduardus Jacobus, to U.S. Philips Corporation. Arrangement for signal delay, particularly for use in a vertical aperture corrector for television. 3,925,608, Cl. 178-7.100.
Mollet, Prudent Eduardus Jacobus: *See—*
Blom, Hendrik; and Mollet, Prudent Eduardus Jacobus, 3,925,812.
Monarch Marking Systems, Inc.: *See—*
Bussard, Charles B.; Hamisch, Paul H., Sr.; and Wisecup, David R., 3,924,523.
Monsanto Company: *See—*
Andersen, Harry M., 3,925,287.
Clarke, Fredric B., III, 3,925,453.
Green, Richard L.; and Wygant, James C., 3,925,217.
Heimsch, Robert A.; and Reaville, Eric T., 3,925,076.
Heimsch, Robert Arthur; and Mottus, Edward Hugo, 3,925,325.
Heitsch, Charles W., 3,925,467.
Li, Tao P.; and Hobbs, Charles W., 3,925,255.
Maier, Ludwig, 3,925,455.
Ort, Morris R., 3,925,338.
Montel, Gerard: *See—*
Trombe, Jean-Christian; and Montel, Gerard, 3,925,062.
Montezinos, Beverly K.: *See—*
Axon, Gordon L.; and Montezinos, Beverly K., 3,925,013.
Montgomery, Robert T., to Celanese Corporation. Process for preparing supported ribbons. 3,925,134, Cl. 156-178.000.
Moore, Lawrence A., to Beloit Corporation. Blow molding apparatus having side discharge of finished articles. 3,924,998, Cl. 425-387.00B.

Moore, Wayne E., to United States of America, Navy. Maximum pulse density detector. 3,925,733, Cl. 328-140.000.

Moorhouse, Thomas R., to American Polywater Corporation. Lubricating composition for conduits and raceways. 3,925,216, Cl. 252-49.300.

Morabito, Salvatore: *See—*
Avery, Hazelton H.; and Morabito, Salvatore, 3,924,789.

Moreau, James O.; and Halko, Richard A., to Exxon Research and Engineering Co. Oil pollution totalizer. 3,924,449, Cl. 73-61.10R.

Moreau, Michele: *See—*
Karadavidoff, Isaac; and Moreau, Michele, 3,925,552.

Morelli, Joseph L., to Litton Business Systems, Inc. Cartridge with resilient connecting means. 3,924,727, Cl. 197-151.000.

Morgan, Charles R., to W. R. Grace & Co. Solid curable polyene compositions containing liquid polythiols and solid styrene-allyl alcohol copolymer based polyenes. 3,925,320, Cl. 260-77.5CR.

Morgan, Leonora Elizabeth Nash. Humidity altering device. 3,924,807, Cl. 239-55.000.

Morgardshammar AB: *See—*
Haggren, Erik, 3,924,815.

Mori, Hirohumi: *See—*
Miyoshi, Hiroshi; Mori, Hirohumi; and Tanoue, Yoriko, 3,925,269.

Mori, Kazuo: *See—*
Ishizumi, Kikuo; Mori, Kazuo; Yamamoto, Michihiro; Koshiba, Masao; Inaba, Shigeho; and Yamamoto, Hisao, 3,925,382.
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,925,364.

Morimoto, Takeshi: *See—*
Oda, Yoshio; Uchida, Keiichi; Suhara, Manabu; and Morimoto, Takeshi, 3,925,464.

Morita, Akiyoshi: *See—*
Yabuta, Tozo; Kaneko, Yasuhisa; and Morita, Akiyoshi, 3,925,252.

Moroni, Rolf; Rinck, Friedrich Karl; and Ehlenz, Peter, to Collo Rheincollodium Koln GmbH Werk Hersel. Filter medium for gases. 3,925,248, Cl. 252-428.000.

Morris, Earl L.; and Sally, Theodore J., to Acorn Engineering Company. Hanger and support structure for toilet bowls and the like. 3,924,279, Cl. 4-252.00R.

Morrison, Anna Mae Elsie. Eye protection device for aminals. 3,924,388, Cl. 54-80.000.

Morrison, David J. Double soap bar. 3,925,225, Cl. 252-90.000.

Morton-Norwich Products, Inc.: *See—*
Fiedelman, Howard W., 3,925,027.

Moscioni, Richard Joseph; and Sellar, Gerald Miller, to Western Electric Company, Inc. Device for clamping elongated member. 3,924,920, Cl. 339-246.000.

Moss, John Hickman; and Leng, Barrie, to British Titan Limited. Production of titanium tetrahalide. 3,925,531, Cl. 423-76.000.

Motegi, Akira: *See—*
Azuma, Kishiro; Tsuji, Isao; Kato, Hiroyuki; Tatemichi, Hidemaro; Motegi, Akira; Suzuki, Osamu; and Kondo, Kishichiro, 3,925,322.

Motoren- und Turbinen-Union Munchen GmbH: *See—*
Pollert, Wolfgang, 3,924,404.

Motorenfabrik Hatz KG.: *See—*
Hatz, Ernst; and Schmuck, Johann, 3,924,597.

Motorola, Inc.: *See—*
Bachmann, Mario E., 3,925,819.

Motoyoshi, Kenya: *See—*
Osawa, Makoto; Hagiwara, Yoshitoshi; Kusaka, Kunio; Kawakita, Takao; Motoyoshi, Kenya; and Kuroishi, Nobuhito, 3,925,065.

Mottus, Edward Hugo: *See—*
Heimsch, Robert Arthur; and Mottus, Edward Hugo, 3,925,325.

Mould, Frank, to Contexo Limited. Cutting tool for wallpaper. 3,924,328, Cl. 30-307.000.

MSI Data Corporation: *See—*
Hester, Gerald, 3,925,639.

Muacevic, Gojko: *See—*
Koppe, Herbert; Kummer, Werner; Stahle, Helmut; and Muacevic, Gojko, 3,925,446.

Mueller Co.: *See—*
Ellis, Daniel A., 3,924,882.
Leopold, Wilbur R., Jr.; Hackman, Frank C.; Luckenbill, Lawrence F.; and Ellis, Daniel A., 3,924,877.

Mueller-Tamm, Heinz; Schick, Hannes; Rau, Wolfgang; and Hennenberger, Peter, to BASF Aktiengesellschaft. Process for working up particulate polyolefins obtained by polymerization carried out with the aid of Ziegler/Natta catalysts. 3,925,341, Cl. 260-93.700.

Muench, Rudolph E., to Fasco Industries, Inc. Mechanical latch relay. 3,925,742, Cl. 335-186.000.

Muir, Alexander R.: *See—*
Dewhirst, Donald R.; and Muir, Alexander R., 3,924,930.

Mulder, Jan Pieter Fokke, to De Rotterdamsche Droogdok Maatschappij B.V. Process for welding a cladding onto a base material. 3,925,634, Cl. 219-76.000.

Muller, Friedemann: *See—*
Eicher, Theo; Muller, Friedemann; and Krebs, Klaus-Werner, 3,924,642.

Muller, Hans. Apparatus for culturing of tissue cells and microorganisms. 3,925,165, Cl. 195-127.000.

Muller, Hans Rudolf: *See—*
Bateman, Charles Donald; and Muller, Hans Rudolf, 3,925,751.

Muller, Karl-Heinz; Rohr, Harry; and Ott, Karl-Heinz, to Bayer Aktiengesellschaft. Method for preparing a completely covered foam molding. 3,925,528, Cl. 264-54.000.

Muller, Rudolf: *See—*
Heiler, Wolfgang; Muller, Rudolf; and Becker, Jean-Jacques, 3,924,551.

Muller, Wolfgang: *See—*
Reich, Manfred; Muller, Wolfgang; and zur Hausen, Manfred, 3,925,490.

Multi-Metal Wire Cloth Inc.: *See—*
Bradley, Robert C.; and Fulton, Garland L., 3,925,209.

Multiple Originals, Inc.: *See—*
Maxwell, Paul E., 3,925,586.

Muneyuki, Ryonosuke: *See—*
Kondo, Eiji; Mitsugi, Takashi; and Muneyuki, Ryonosuke, 3,925,155.

Munroe, James L.; and DeBaryshe, Paul Gregory, to Jersey Nuclear-Avco Isotopes, Inc. Method and apparatus for sequentially combining pulsed beams of radiation. 3,924,937, Cl. 350-285.000.

Munshower, Kenneth, to Elco Corporation. Flat cable termination method and apparatus. 3,924,917, Cl. 339-17.00F.

Murai, Koichi; Choshi, Yasuo; and Kobayashi, Toshiaki, to New Japan Chemical Company, Limited. Paint compositions. 3,925,278, Cl. 260-22.00R.

Murakami, Shin-Ichi, to Fuji Xerox Co., Ltd. Paper feed apparatus for gripper-type paper transport device. 3,924,848, Cl. 271-10.000.

Murakami, Shinichi, to Fuji Xerox Co., Ltd. Paper gripping device for use with a chain driven paper carriage. 3,924,849, Cl. 271-277.000.

Murphy, Michael P., to General Motors Corporation. Exhaust gas recirculation system. 3,924,587, Cl. 123-119.00A.

Musashi, Akira; Yamazaki, Masami; and Hiruta, Makoto, to Nippon Soda Company, Ltd. Flameproof polybutadiene resin composition having excellent electrical properties. 3,925,275, Cl. 260-17.4CL.

N.R.G. Equipment Corporation: *See—*
Mayo, Frederick W., 3,925,033.

Naarmann, Herbert: *See—*
Heinrich, Bernhard; Naarmann, Herbert; and Thoma, Peter, 3,925,329.

Naber, Charles T., to NCR Corporation. Multilevel conductor structure and method. 3,925,572, Cl. 427-87.000.

Nadella S.A.: *See—*
Pitner, Alfred, 3,924,912.

Nadelson, Jeffrey: *See—*
Houlihan, William J.; and Nadelson, Jeffrey, 3,925,476.

Nagasawa, Mashahiro; Watanabe, Hiroyuki; and Wakabayashi, Takashi, to Matsushita Electric Industrial Co., Ltd. Automatic control device for car lighting. 3,925,244, Cl. 250-372.000.

Nairn Floors Limited: *See—*
Brown, Robert, 3,925,130.

Naito, Hirokuni; Yoshimura, Isao; and Nakano, Hiroo, to Asahi-Dow Limited. Hydrophilic membrane and process for the preparation thereof. 3,925,332, Cl. 260-79.30R.

Najer, Henry; and Pascal, Yves Robert Alain, to Synthelabo. Process for preparing vincamine and its stereoisomers. 3,925,392, Cl. 260-293.530.

Nakagawa, Kunio: *See—*
Kogure, Katsura; and Nakagawa, Kunio, 3,925,458.

Nakai, Yasushi: *See—*
Tsunemitsu, Katsuhiko; Kiuchi, Kanji; Nakai, Yasushi; Kawai, Hajime; and Yamada, Shimpei, 3,925,457.

Nakaizumi, Yasushi: *See—*
Nomura, Setsuo; Komoda, Tsutomu; and Nakaizumi, Yasushi, 3,925,706.

Nakamura, Hidetosi: *See—*
Sakato, aoyuki; and Nakamura, Hidetosi, 3,925,289.

Nakamura, Mutsuaki: *See—*
Takahashi, Noboru; Nakamura, Mutsuaki; Ozaki, Sadao; Isono, Hiromasa; and Fukushima, Iwao, 3,925,114.

Nakamura, Tsutomu: *See—*
Suzuki, Nagayuki; Nakamura, Tsutomu; and Yamada, Katsuto, 3,925,584.

Nakano, Hiroo: *See—*
Naito, Hirokuni; Yoshimura, Isao; and Nakano, Hiroo, 3,925,332.

Nakano, Soichi; and Iizuka, Yoshitoku, to Honda Giken Kogyo Kabushiki Kaisha. Gasket. 3,924,863, Cl. 277-235.00B.

Nakano, Yasuaki, to Hitachi, Ltd. Multi-channel sound signal generating and reproducing circuits. 3,925,615, Cl. 179-1.0GQ.

Nakao, Masaru: *See—*
Maruyama, Isamu; Nakao, Masaru; Sasajima, Kikuo; Ono, Keiichi; Takayama, Masaharu; Katayama, Shigenari; Tanaka, Yoshihiro; Yanagihara, Izumi; Inaba, Shigeho; and Yamamoto, Hisao, 3,925,387.

Nakatani, Atsutada, to Copal Company Limited. Shutter control arrangement for cameras. 3,925,799, Cl. 354-235.000.

Nakazawa, Nobuhiko: *See—*
Ogawa, Hiroshi; Nitta, Kazuo; Nakazawa, Nobuhiko; and Maki, Kentaro, 3,925,020.

Nalco Chemical Company: *See—*
Baimbridge, Charles L.; Minderhout, James R.; Bearman, Robert W.; and Carpenter, Donald E., 3,925,169.

Napolitano, Pellegrino E., to Flume Stabilization Systems, Inc. Stabilizing fin system. 3,924,555, Cl. 114-126.000.

Nara, Kiyoshi; Katamoto, Kazuyoshi; Ohta, Kazuhiko; and Fukuda, Hideo, to Takeda Chemical Industries, Ltd. Crystallization of alpha monosodium citrate monohydrate. 3,925,465, Cl. 260-535.00P.

Narahara, Hisaaki: *See*—
Ishigaki, Yoshio; Narahara, Hisaaki; and Tsuchiya, Takao, 3,925,810.

Narrace, John M.: *See*—
Silva, Jose R.; and Narrace, John M., 3,924,606.

Naruse, Yosuke; Yoshioka, Taisuke; Himuro, Masami; and Ito, Keiichi, to Sony Corporation. Apparatus for recording and/or reproducing information signals having automatic focusing. 3,925,603, Cl. 178-6.60R.

National Research Development Corporation: *See*—
Carr-Brion, Kenneth Garfield, 3,925,661.
Freeman, Michael Alexander Reykers; and Swanson, Sydney Alan Vasey, 3,924,277.

National Starch and Chemical Corporation: *See*—
Davis, Irwin; Skoultchi, Martin M.; and Fries, John A., 3,925,282.
Ganslaw, Stuart Harold; and Walker, James L., 3,925,288.

Nazzaro, Charles A.: *See*—
Bergman, Steven C.; Gnirrep, Thomas B.; and Nazzaro, Charles A., 3,925,644.

NCR Corporation: *See*—
Gay, Leslie W., 3,925,775.
Naber, Charles T., 3,925,572.

Nebeker, Eugene B.; and Rodriguez, Sergio E., to Scientific Associates, Inc. Method and apparatus for producing and utilizing percussive liquid jets. 3,924,805, Cl. 239-1.000.

NeeTree Corporation: *See*—
Price, Roger W., 3,924,669.

Nellessen, Alfred H.: *See*—
Holmen, Reynold E.; and Nellessen, Alfred H., 3,924,929.

Nelson, Alvin M. Thermo-cloud electric mattress. 3,924,284, Cl. 5-347.000.

Nelson, Philip H., Jr., to General Electric Company. Viscosity control for a plastic molding machine. 3,924,840, Cl. 259-191.000.

Nelson, Roger John, to Deere & Company. Hydraulic pump or motor. 3,924,516, Cl. 91-491.000.

Netz, Otto: *See*—
Corte, Herbert; Heller, Harold; and Netz, Otto, 3,925,264.

Neville, Richard Ernest Gartside; and Garrett, John A., to AMF Incorporated. Tobacco moistening method. 3,924,645, Cl. 131-140.00A.

New Japan Chemical Company, Limited: *See*—
Murai, Koichi; Choshi, Yasuo; and Kobayashi, Toshiaki, 3,925,278.

New Twist Connector Corporation: *See*—
Feightner, Lewis Clark, 3,924,921.

Newman, Douglas A.: *See*—
Brown, Albert E.; Schlotzhauer, Allan T.; and Newman, Douglas A., 3,924,728.

Newman, Jerry F.: *See*—
Reamey, Herbert K.; and Newman, Jerry F., 3,925,092.

Newman, Norman: *See*—
Fisch, Richard S.; and Newman, Norman, 3,925,175.

Newyear, Raymond W.: *See*—
Lewis, James M.; and Newyear, Raymond W., 3,925,077.

Nibco Inc.: *See*—
Korrell, Melvin H.; and Gay, Sandy C., 3,924,833.

Nichols, Charles E.: *See*—
Andrus, Edward R., Jr.; Fahnstrom, Dale E.; Hansen, James G.; and Nichols, Charles E., 3,924,309.

Nicks, Peter Francis: *See*—
Osborn, Peter George; and Nicks, Peter Francis, 3,925,295.

Nielsen, Gail R.: *See*—
Miller, Lowell E.; and Nielsen, Gail R., 3,925,772.

Niemeyer, Heinrich, to Wesfalia Separator AG. Centrifuge for the separation of mixtures of liquids. 3,924,804, Cl. 233-19.00A.

Nigam, Anant Kumar: *See*—
French, Joseph Charles; Nigam, Anant Kumar; and Sessler, Gerhard Martin, 3,925,610.

Nihon Cement Company Limited: *See*—
Yoshida, Eiji; and Hayashi, Yoshimasa, 3,925,091.

Nilsen, Roy J., to United States of America, Energy Research and Development Administration. Precise carbon control of fabricated stainless steel. 3,925,109, Cl. 148-6.350.

Ning, Robert Ye-Fong; and Schwartz, Morton A., to Hoffmann-La Roche Inc. 1-Lower alkyl-2-substituted-1,4-benzodiazepines. 3,925,358, Cl. 260-239.0BD.

Ninke, William Herbert, to Bell Telephone Laboratories, Incorporated. Animated display systems with dither threshold hysteresis band. 3,925,609, Cl. 178-7.30D.

Ninomiya, Koichiro: *See*—
Waniishi, Kenji; and Ninomiya, Koichiro, 3,924,838.

Nippon Electric Company Limited: *See*—
Saito, Yuji, 3,925,700.

Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha: *See*—
Sawada, Atsuo, 3,925,336.

Nippon Oil Company Ltd.: *See*—
Horii, Hideo; Kaiya, Atsushi; and Otsuki, Yutaka, 3,925,279.

Nippon Sheet Glass Co., Ltd.: *See*—
Kushihashi, Akira; Fuziwara, Yutaka; and Akashi, Naotomo, 3,925,050.

Nippon Soda Company, Ltd.: *See*—
Musashi, Akira; Yamazaki, Masami; and Hiruta, Makoto, 3,925,275.

Nippon Steel Corporation: *See*—
Shimada, Shunsaku; and Inazumi, Tadahiro, 3,925,069.
Takechi, Hiroshi; Kawano, Tsuyoshi; Hashizume, Toshio; Koyama, Kazuo; and Masui, Hiroaki, 3,925,111.

Nippon Telegraph and Telephone Public Corporation: *See*—
Kato, Kunihiro; Matsuda, Ryoichi; and Okayasu, Ryoichi, 3,925,618.
Suzuki, Kinya; and Izumi, Tokio, 3,925,598.

Nippondenso Co., Ltd.: *See*—
Ota, Nobuyoshi; and Tashiro, Hiroyuki, 3,925,754.

Nischk, Gunther: *See*—
Velker, Eugen; Bentz, Francis; and Nischk, Gunther, 3,925,515.

Nishijima, Kouji: *See*—
Sugimoto, Keiichi; Nishijima, Kouji; and Kakeya, Nobuharu, 3,925,362.

Nishikawa, Tadashige: *See*—
Matsui, Kazumi; Umemori, Takashi; Matsuura, Kenji; Hosoda, Yoshikado; Nishikawa, Tadashige; and Tawara, Makoto, 3,924,537.

Nishita, Sadao: *See*—
Ishii, Hajime; Bannai, Nubuo; and Nishita, Sadao, 3,925,339.

Nissan Motor Company Limited: *See*—
Ookubo, Takashi; and Hamada, Hideo, 3,924,717.

Nisshin Flour Milling Co., Ltd.: *See*—
Kogure, Katsura; and Nakagawa, Kunio, 3,925,458.

Nitta, Kazuo: *See*—
Ogawa, Hiroshi; Nitta, Kazuo; Nakazawa, Nobuhiko; and Maki, Kentaro, 3,925,020.

Nitto Electric Industrial Co., Ltd.: *See*—
Kojima, Makoto; Noda, Yuzuru; Suzuki, Yasuhiro; and Okamoto, Toshihide, 3,925,313.

Nitto Kohki Co., Ltd.: *See*—
Mitsuhashi, Shigeru; Hirokawa, Kyoichi; Saito, Noboru; Kaneko, Minoru; Shoji, Michihiro; Kowada, Masunari; and Kazama, Yasuo, 3,924,330.

Noda, Yuzuru: *See*—
Kojima, Makoto; Noda, Yuzuru; Suzuki, Yasuhiro; and Okamoto, Toshihide, 3,925,313.

Noe, Oskar, to BWG Bergwerk- und Walzwerk-Maschinenbau GmbH, Firma. Method of and apparatus for descaling and leveling a metal strip. 3,924,428, Cl. 72-40.000.

Nogami, Sumitaka: *See*—
Ibata, Jyoji; Kobayashi, Hidehiko; Toyomoto, Kazuo; Suzuoki, Kazuhiro; and Nogami, Sumitaka, 3,925,272.

Nohira, Hidetaka; and Kobashi, Kiyoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas recirculating apparatus. 3,924,589, Cl. 123-119.00A.

Nomiya, Kosei, to Hitachi, Ltd. Logic circuit having common load element. 3,925,686, Cl. 307-205.000.

Nomura, Hiroaki: *See*—
Okada, Hiroaki; Fujisawa, Hiroshi; Fujita, Masahiko; Shimamoto, Tsugio; and Nomura, Hiroaki, 3,925,357.

Nomura, Masayoshi: *See*—
Saida, Hiroji; Ono, Yuichi; Nomura, Masayoshi; Tamura, Masao; and Kozuka, Hirotsugu, 3,925,120.

Nomura, Nobuki: *See*—
Ogura, Eiji; Nomura, Nobuki; and Emoto, Kiyotada, 3,925,247.

Nomura, Setsuo; Komoda, Tsutomu; and Nakaizumi, Yasushi, to Hitachi, Ltd. Field emission electron gun device of the automatic control type. 3,925,706, Cl. 315-383.000.

Nordstrom, Kjell: *See*—
Flinth, Rune; and Nordstrom, Kjell, 3,924,729.

North American Philips Corporation: *See*—
Kenney, George Churchill, 3,925,811.

Norton Company: *See*—
Keat, Paul P., 3,925,035.

Norwood Marking & Equipment Co., Inc.: *See*—
Shenoha, James L.; and Sheth, Bud, 3,924,527.

Nowak, Herbert: *See*—
Dahm, Johann; Borck, Joachim; Nowak, Herbert; Zimane, Zdenek; and Kayser, Detlev, 3,925,394.

NRM Corporation: *See*—
Barton, Dale S.; and Yendrich, Stephen P., Jr., 3,924,983.

Nuss, James J., to General Electric Company. Wall oven exhaust duct system. 3,924,601, Cl. 126-21.00R.

Nusslein, Ludwig; and Arndt, Friedrich, to Schering Aktiengesellschaft. Herbicidal oxime esters of phenoxyalkanoic esters and their use as selective herbicides. 3,925,473, Cl. 260-566.0AE.

Nuzzi, Francis J.: *See*—
Polichette, Joseph; Leech, Edward J.; and Nuzzi, Francis J., 3,925,578.

Nye, Allan R.: *See*—
Colburn, John W., Jr.; Wood, Charles D., III; Mathis, Ronald J.; and Nye, Allan R., 3,924,897.

Nystrand, Ernst Daniel, to Paper Converting Machine Company. Disposable diaper. 3,924,627, Cl. 128-287.000.

Obendorf, Werner; Lindner, Irmgard; Schwarzinger, Ernst; and Krieger, Josef, to Osterreichische Stickstoffwerk Aktiengesellschaft. Cycloamidines. 3,925,412, Cl. 260-326.470.

O'Brien, Darrell E.; Robins, Roland K.; and Springer, Robert H., to ICN Pharmaceuticals, Inc. 6-Carbethoxy-3,7-disubstituted-pyrazolo[1,5a]pyrimidines. 3,925,385, Cl. 260-256.40F.

Ocean Cable Co., Ltd.: *See*—
Suzuki, Kinya; and Izumi, Tokio, 3,925,598.

O'Connor, John Vincent, to Johns-Manville Corporation. Injection molded plastic pipe fitting. 3,924,881, Cl. 285-156.000.

Oda, Kiyoshi, to Yoshida Kogyo Kabushiki Kaisha. Lock slider. 3,924,306, Cl. 24-205.14R.

Oda, Yoshio; Uchida, Keiichi; Suhara, Manabu; and Morimoto, Takeshi, to Asahi Glass Co., Ltd. Process for preparing unsaturated carboxylic acids from the corresponding unsaturated aldehydes. 3,925,464, Cl. 260-530.00N.

Odom Sausage Co. Inc. of Kentucky: *See*—
Wilkerson, James E., 3,924,296.

Ogawa, Akira: *See*—
Sato, Akira; Ogawa, Akira; Shiba, Keisuke; and Hinato, Masanao, 3,925,085.

Ogawa, Haruki: *See*—
Okuda, Itsuki; Shinohara, Hiroshi; Ogawa, Haruki; and Itoh, Hideo, 3,925,555.

Ogawa, Hiroshi; Nitta, Kazuo; Nakazawa, Nobuhiko; and Maki, Kentaro, to Mallinckrodt, Inc. Method for determining the total iron-binding capacity of blood serum. 3,925,020, Cl. 23-230.00B.

Ogawa, Ryota: *See*—
Takahashi, Yasuo; and Ogawa, Ryota, 3,924,935.

Ogilvie Flour Mills Company Limited: *See*—
Hampton, Richard John; Rolland, Jacques Robert; and Gallo, Thomas, 3,925,343.

Ogoshi, Toshiaki: *See*—
Toyoda, Sadao; Ogoshi, Toshiaki; Maruyama, Minoru; and Miyawaki, Yozo, 3,925,441.

Ogura, Eiji; Nomura, Nobuki; and Emoto, Kiyotada, to Onoda Cement Company, Ltd. Method for preparing catalyst for the production of vinyl fluoride. 3,925,247, Cl. 252-429.00R.

Ogura, Jiro; Seki, Ikuo; Sato, Kiyotaka; Takahashi, Masaaki; Ito, Akira; and Igarashi, Yuriko, to Kureha Kagaku Kogyo K.K. Electrical insulation oil. 3,925,222, Cl. 252-63.700.

Oguri, Masatoshi: *See*—
Doi, Yasushi; Shoda, Mikio; Oguri, Masatoshi; and Hashimoto, Joji, 3,925,602.

Oh, Hans, to Sandoz, Inc. 1-Substituted-4-aryl-2(1H)-quinazolinones as pharmaceutical agents. 3,925,548, Cl. 424-251.000.

Ohno, Norihiro: *See*—
Takenouchi, Kuniyoshi; Ohno, Norihiro; and Kondo, Fusao, 3,925,226.

Ohoishi, Junichi: *See*—
Ishida, Torao; Ohoishi, Junichi; Yoshida, Kouichi; Akashi, Kageyasu; Takeda, Isao, deceased; and Takeda, Emiko, legal representative, 3,925,415.

Ohoka, Tadaaki: *See*—
Shimojima, Yukiji; Takeda, Isao, deceased; Takeda, Emiko, legal representative; Mizuno, Masayuki; Mizuno, Yukiko; and Ohoka, Tadaaki, 3,925,546.

Ohta, Kazuhiko: *See*—
Nara, Kiyoshi; Katamoto, Kazuyoshi; Ohta, Kazuhiko; and Fukuda, Hideo, 3,925,465.

Ohtori, Keizo: *See*—
Watanabe, Mikio; and Ohtori, Keizo, 3,924,424.

Ohtsuka, Shuji; and Sato, Toshio, to Tamura Electric Works, Ltd. Electromagnetic counter. 3,925,741, Cl. 335-140.000.

Ohtuka, Masayoshi: *See*—
Oshima, Yujiro; Kataoka, Masao; Tutui, Osamu; Shibayama, Noboru; Ohtuka, Masayoshi; and Ozaki, Shigehito, 3,924,457.

Ohuchi, Kazuo: *See*—
Sakai, Kiyoshi; Inoue, Kenji; Tajima, Yawara; Yamazaki, Mitsuo; Ohuchi, Kazuo; and Yusa, Takashi, 3,925,451.

Oil Shale Corporation, The: *See*—
Whitcombe, John A.; Van Zanten, Kenneth D.; and Kane, George C., 3,925,190.

Oishi, Masayoshi, to Sun Ventures, Inc. Dehydrocyclization of hydrocarbons. 3,925,254, Cl. 252-455.00Z.

Oka, Shunzo: *See*—
Minami, Shunji; Oka, Shunzo; and Takemura, Takehide, 3,925,720.

Okabe, Katsuhiko: *See*—
Wada, Yasuhiro; and Okabe, Katsuhiko, 3,925,778.

Okada, Hiroaki; Fujisawa, Hiroshi; Fujita, Masahiko; Shimamoto, Tsugio; and Nomura, Hiroaki, to Takeda Chemical Industries, Ltd. α-sulfobenzylpenicillin salt. 3,925,357, Cl. 260-239.100.

Okamoto, Tadashi: *See*—
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,925,364.

Okamoto, Toshihide: *See*—
Kojima, Makoto; Noda, Yuzuru; Suzuki, Yasuhiro; and Okamoto, Toshihide, 3,925,313.

Okayasu, Ryoichi: *See*—
Kato, Kunihiro; Matsuda, Ryoichi; and Okayasu, Ryoichi, 3,925,618.

Okert, Adolph P. Apparatus and method for electrolytic sewage treatment. 3,925,176, Cl. 204-152.000.

Okiyama, Toshiaki: *See*—
Sugi, Ichirow; Takenaka, Haruo; Okiyama, Toshiaki; and Kobayashi, Teruo, 3,925,573.

Okorodudu, Abraham O. M.: *See*—
Landis, Phillip S.; and Okorodudu, Abraham O. M., 3,925,414.

Okuda, Itsuki; Shinohara, Hiroshi; Ogawa, Haruki; and Itoh, Hideo, to Kumiai Chemical Industry Co,. Method of controlling mites using chloromethanesulfonamide. 3,925,555, Cl. 424-321.000.

Olcott, Eugene L., to Atlantic Research Corporation. Method for making reinforced pyrolytic graphite-silicon carbide microcomposites. 3,925,133, Cl. 156-175.000.

Oliva, George R., Jr.: *See*—
Anderl, Josef H.; and Oliva, George R., Jr., 3,925,782.

Olle Blomqvist Rehab-Produkter AB: *See*—
Ekman, Lars Gustaf, 3,924,278.

Olsen, Keith H.; and Christmann, Marvin H., to Minnesota Mining and Manufacturing Company. Method for producing epitaxial thin-film fabry-perot cavity suitable for use as a laser crystal by vacuum evaporation and product thereof. 3,925,146, Cl. 156-601.000.

Olsson, Knut Gunnar: *See*—
Borretzen, Bernt; Olsson, Knut Gunnar; and Sundbeck, Bertil, 3,925,487.

Olympia Werke AG: *See*—
Kerzel, Gunter, 3,924,724.

Olympus Optical Co., Ltd.: *See*—
Mitsui, Kazuhiko, 3,924,608.

Omron Corporation of America: *See*—
Yamamoto, Mititaka, 3,924,932.

Onarheim, Einar, to Elkem-Spigerverket A/S. Method of recycling silicon dioxide. 3,925,058, Cl. 75-1.000.

Ono, Keiichi: *See*—
Maruyama, Isamu; Nakao, Masaru; Sasajima, Kikuo; Ono, Keiichi; Takayama, Masaharu; Katayama, Shigenari; Tanaka, Yoshihiro; Yanagihara, Izumi; Inaba, Shigeho; and Yamamoto, Hisao, 3,925,387.

Ono, Yuichi: *See*—
Saida, Hiroji; Ono, Yuichi; Nomura, Masayoshi; Tamura, Masao; and Kozuka, Hirotsugu, 3,925,120.

Onoda Cement Company, Ltd.: *See*—
Ogura, Eiji; Nomura, Nobuki; and Emoto, Kiyotada, 3,925,247.

Ooba, Shigehiro: *See*—
Tottori, Nobumasa; Kato, Toshiro; Asano, Yasuhisa; Ueda, Minoru; Kirino, Osamu; Ooba, Shigehiro; Fujinami, Akira; and Ozaki, Toshiaki, 3,925,554.

Ookubo, Takashi; and Hamada, Hideo, to Nissan Motor Company Limited. Fluid actuated clutch. 3,924,717, Cl. 192-86.000.

op de Laak, Johannes H. A.: *See*—
Koeleman, Geradus A. J.; and op de Laak, Johannes H. A., 3,924,567.

Optarac Corporation: *See*—
Dunchock, Richard S., 3,924,750.

Optimol-Oelwerke GmbH: *See*—
Froeschmann, Rasmus; and Sprugel, Friedrich, 3,925,213.

Orberg, Robert Elliott. Seal and curtain support means. 3,924,365, Cl. 52-63.000.

Orr, Robert S.: *See*—
Caldwell, Samuel I.; Orr, Robert S.; and White, Duane D., 3,924,485.

Ort, Morris R., to Monsanto Company. Control of polymer particle size in olefin polymerization. 3,925,338, Cl. 260-88.20R.

Osawa, Makoto; Hagiwara, Yoshitoshi; Kusaka, Kunio; Kawakita, Takao; Motoyoshi, Kenya; and Kuroishi, Nobuhito, to Honda Giken Kogyo Kabushiki Kaisha; and Sumitomo Electric Industries, Ltd. Valve seat materials for internal combustion engines. 3,925,065, Cl. 75-128.00R.

Osborn, Peter George; and Nicks, Peter Francis, to Imperial Chemical Industries Limited. Process for the preparation of polymer dispersions. 3,925,295, Cl. 260-34.200.

Osborne, Thomas A.: *See*—
Cook, William A.; and Osborne, Thomas A., 3,924,633.

Oshima, Yujiro; Kataoka, Masao; Tutui, Osamu; Shibayama, Noboru; Ohtuka, Masayoshi; and Ozaki, Shigehito, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Misfire detecting device for internal combustion engine. 3,924,457, Cl. 73-116.000.

Osmond, Desmond Wilfrid John; Smith, Norman Douglas Patrick; and Waite, Frederick Andrew, to Imperial Chemical Industries Limited. Control of liquid dissemination. 3,925,032, Cl. 44-62.000.

Ossman, John W., Jr., to Haake, Inc. Torque sensor with means for mechanical damping. 3,924,459, Cl. 73-136.00R.

Ostbergs Fabriks AB: *See*—
Lindblom, Karl Thore; and Forslund, Erik Torsten, 3,924,704.

Osterreichische Stickstoffwerk Aktiengesellschaft: *See*—
Obendorf, Werner; Lindner, Irmgard; Schwarzinger, Ernst; and Krieger, Josef, 3,925,412.

Oswin, Harry G.; and Blurton, Keith F., to Energetics Science, Inc. Gas detecting and quantitative measuring device. 3,925,183, Cl. 204-195.00R.

Ota, Nobuyoshi; and Tashiro, Hiroyuki, to Nippondenso Co., Ltd. Mileage warning system. 3,925,754, Cl. 340-52.00D.

Otani, Tadahiko, to Hitachi, Ltd. Variable Venturi type carburetor. 3,925,521, Cl. 261-39.00A.

Otsuki, Yutaka: *See*—
Horii, Hideo; Kaiya, Atsushi; and Otsuki, Yutaka, 3,925,279.

Ott, Hans, to Sandoz, Inc. 1-Substituted-quinazoline-2(1H)-thiones in the treatment of inflammation. 3,925,549, Cl. 424-251.000.

Ott, Karl-Heinz: *See*—
Muller, Karl-Heinz; Rohr, Harry; and Ott, Karl-Heinz, 3,925,528.
Schuster, Herbert; Huther, Edmund; Ott, Karl-Heinz; and Dinges, Karl, 3,925,513.

Ott, William Michael, Jr.: *See*—
Betts, Joseph Elwood; Ott, William Michael, Jr.; and Vaum, Howard Thomas, 3,924,985.

Otterstetter, Charles H., to Ford Motor Company. Sprayable material changer apparatus. 3,924,810, Cl. 239-305.000.

Ottestad, Jack B., to Impulse Products Corporation. Control means for a fluid-powered device. 3,924,513, Cl. 91-224.000.

Otto, Oberdan W., to Leland Stanford Jr. University, The Board of Trustees of. Apparatus for transforming electronics signals between the time and frequency domains utilizing acoustic waves. 3,925,653, Cl. 235-181.000.

Overkott, Franz Josef, to Peddinghaus, Carl Ullrich, Dr. Method for making cartridges containing pressure gas and means for carrying out this method. 3,924,382, Cl. 53-7.000.

Owens-Corning Fiberglas Corporation: *See—*
Bartlow, David H.; Jones, Bernard Howard; and Pearson, Lee E., 3,925,132.
Haas, James Lynn, 3,925,526.
Roberts, Michael G.; and Chase, Kenneth P., 3,925,300.
Symborski, Alex P., 3,924,817.
Wolf, Warren W., 3,924,927.

Owens-Illinois, Inc.: *See—*
Benner, Robert A.; Fisher, Philip H.; and Parlette, Carl L., 3,924,565.
Fein, Michael E.; and Hinson, David C., 3,925,697.
Fillmore, William E., 3,924,769.
Schermerhorn, Jerry D., 3,925,703.

Oyama, Yoshishige: *See—*
Hosho, Yukio; Oyama, Yoshishige; and Karino, Kimiji, 3,924,407.

Ozaki, Sadao: *See—*
Takahashi, Noboru; Nakamura, Mutsuaki; Ozaki, Sadao; Isono, Hiromasa; and Fukushima, Iwao, 3,925,114.

Ozaki, Shigehito: *See—*
Oshima, Yujiro; Kataoka, Masao; Tutui, Osamu; Shibayama, Noboru; Ohtuka, Masayoshi; and Ozaki, Shigehito, 3,924,457.

Ozaki, Toshiaki: *See—*
Tottori, Nobumasa; Kato, Toshiro; Asano, Yasuhisa; Ueda, Minoru; Kirino, Osamu; Ooba, Shigehiro; Fujinami, Akira; and Ozaki, Toshiaki, 3,925,554.

Ozark-Mahoning Company: *See—*
Meshri, Dayal T.; and Westfall, Darrell L., 3,925,539.

Ozeki, Takeshi; and Ito, Takao, to Tokyo Shibaura Electric Co., Ltd. Modulation apparatus of semiconductor laser device. 3,925,735, Cl. 332-7.510.

Paap, Hans J.; and Scott, Hubert D., to Texaco Inc. Inelastic gamma ray logging system. 3,925,659, Cl. 250-270.000.

Package Machinery Company: *See—*
Simmons, Charles J., 3,925,139.

Packaging Coordinators, Inc.: *See—*
Gerner, Daniel F., 3,924,747.

Paco Packaging, Inc.: *See—*
Haines, Russell R., 3,924,746.

Pactide Corporation: *See—*
Rodgers, Franklin A., 3,925,167.

Paddock, Gordon R.: *See—*
Beiswenger, David W.; Paddock, Gordon R.; and Ranft, Ernst L., 3,924,408.
Heilman, Gerald D.; Paddock, Gordon R.; and Ranft, Ernst L., 3,924,409.

Pagdin, Brian Colin, to GKN Transmissions Limited. Fuel injection apparatus for internal combustion engines. 3,924,593, Cl. 123-140.0MC.

Palitex Project Company G.m.b.H.: *See—*
Franzen, Gustav; and Veltges, Helmut, 3,924,392.

Papenfuss, Theodor; Rehberg, Rolf; and Spietschka, Ernst, to Hoechst Aktiengesellschaft. Dyestuff preparations and process for their manufacture. 3,925,094, Cl. 106-288.00Q.

Paper Converting Machine Company: *See—*
Nystrand, Ernst Daniel, 3,924,627.

Paris, Nikolaus: *See—*
Hausweiler, Arnold; Paris, Nikolaus; and Ennenbach, Karl-Heinz, 3,925,250.

Park, Im Keun, to Celanese Corporation. Pervious low density carbon fiber reinforced composite articles. 3,925,587, Cl. 428-255.000.

Parker, Paul T.; and Mayer, Ivan, to Exxon Research & Engineering Company. Alkylation process with recovery and regeneration of fluorosulfuric acid catalyst. 3,925,318, Cl. 260-683.580.

Parlette, Carl L.: *See—*
Benner, Robert A.; Fisher, Philip H.; and Parlette, Carl L., 3,924,565.

Parquet, Donald J., to J. I. Case Company. Fluid flow divider valve. 3,924,650, Cl. 137-101.000.

Parrish, William F.: *See—*
Wood, Kenneth E.; Parrish, William F.; and Kennedy, Paul G., 3,925,606.

Parsons, George R.: *See—*
Cady, Edward W.; and Parsons, George R., 3,924,315.

Parsons, Hubert J.; and Peterson, Anders Adolf, to Hardinge Brothers, Inc. Apparatus for actuating a work gripping device. 3,924,514, Cl. 91-420.000.

Partain, James H., to Stone Container Corporation. Carton for refrigerated consumable products. 3,924,801, Cl. 229-39.00R.

Parthasarathy, R., to W. R. Grace & Co. Isomerization of normal paraffins with hydrogen mordenite containing platinum and palladium. 3,925,503, Cl. 260-683.650.

Partridge, Donald F. Circuit for controlling power flow from a high frequency energy source to a plurality of high frequency loads. 3,925,633, Cl. 219-10.490.

Pascal, Yves Robert Alain: *See—*
Najer, Henry; and Pascal, Yves Robert Alain, 3,925,392.

Pasero, Regine: *See—*
Viout, Andre; and Pasero, Regine, 3,925,542.

Pasqualucci, Carmine: *See—*
Marsili, Leonardo; and Pasqualucci, Carmine, 3,925,366.

Patel, Harish A.: *See—*
Taylor, G'enn M.; Patel, Harish A.; and McWhorter, Daniel M., 3,924,634.

Patelhold Patentverwertungs- und Elektro-Holding AG: *See—*
Guanella, Gustav; and Schweizer, Rudolf, 3,925,612.

Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Chekotilo, Leonty Vasilievich; Martyn, Viktor Mikhailovich; Artamonov, Viktor Leonidovich; Bochorishvili, Anzor Ippolitovich; Stupak, Leonid Mikhailovich; Sysenko, Anatoly Petrovich; and Popov, Valery Georgievich. Device for the electroslag casting of ingots. 3,924,672, Cl. 164-252.000.

Paton, Robert Michael: *See—*
Crosby, John; Paton, Robert Michael; and Rennie, Robert Allan Campbell, 3,925,435.

Patterson, Michael Frederick; and Kather, Kenneth Calvin, to Union Carbide Corporation. Thermal swing gas adsorber. 3,925,041, Cl. 55-267.000.

Patterson, Raymond B., III: *See—*
Cook, Koy B., Jr.; Davidson, Jimmy L.; Gibson, Joseph D.; and Patterson, Raymond B., III, 3,924,321.

Paule, Kurt: *See—*
Hess, Johann; Paule, Kurt; Latzina, Kurt; and Wolf, Richard, 3,924,961.

Pearson, Lee E.: *See—*
Bartlow, David H.; Jones, Bernard Howard; and Pearson, Lee E., 3,925,132.

Pearson, Vernon W.: *See—*
Linquist, Wayne; Pearson, Vernon W.; Hagemeyer, Kenneth; and Smeltzer, William E., 3,924,438.

Peddinghaus, Carl Ullrich, Dr.: *See—*
Overkott, Franz Josef, 3,924,382.

Pedersen, Kristen Hald, to Aktieselskabet Jens Villadsens Fabriker. Building construction having three-hinged arched lattice girders. 3,924,368, Cl. 52-86.000.

Pedersen, Robert D.: *See—*
Collins, Arthur A.; and Pedersen, Robert D., 3,925,621.

Pederzini, Renzo: *See—*
Bardotti, Angelo; and Pederzini, Renzo, 3,925,766.

Pedlar, Roy; and Boustred, Brian Malcolm, to Redifon Limited. Ground-based flight simulators. 3,924,342, Cl. 35-12.00N.

Pemsl, Alex: *See—*
Hippel, Ludwig Jakob; and Pemsl, Alex, 3,924,651.

Penner, John. Quick release extension shaft for socket wrenches. 3,924,493, Cl. 81-177.00G.

Pennwalt Corporation: *See—*
Sardo, Alberto Carmelo, 3,924,381.

Peralta, Luis Arturo: *See—*
Cauceglia, Walter Bartholomew; Gerlt, Charles; and Peralta, Luis Arturo, 3,924,370.

Perkin-Elmer Corporation: *See—*
Siegler, E. Horace, Jr., 3,924,950.

Perrotti, Emilio: *See—*
Koch, Paolo; and Perrotti, Emilio, 3,925,413.

Persson, Russell C. Shower safety comfort temperature guide. 3,924,468, Cl. 73-343.00R.

Pescetto, James R., to UMC Industries, Inc. Anti-retrieval device. 3,924,847, Cl. 271-3.000.

Peschke, Reiner, to Messerschmitt-Bolkow-Blohm G.m.b.H. Plastic bearing. 3,924,825, Cl. 244-46.000.

Petersen, Arthur, Sr.; Mackowiak, Leonard S.; and Schoenholz, Daniel, to Hercules Chemical Co., Inc. Solder fluxes. 3,925,112, Cl. 148-25.000.

Peterson, Anders Adolf: *See—*
Parsons, Hubert J.; and Peterson, Anders Adolf, 3,924,514.

Peterson, Bulow A.: *See—*
Lizdas, Thomas E.; and Peterson, Bulow A., 3,924,373.

Peterson, Hans D. D. Powered bovine stomach pump and tube. 3,924,625, Cl. 128-278.000.

Petro-Tex Chemical Corporation: *See—*
Stadig, William P., 3,925,498.

Petroff, Peter D. Processed sewage effluent. 3,925,721, Cl. 324-.50R.

Peyser, Harry A., to Continental Can Company, Inc. Non-detachable easy open flap and tab assembly. 3,924,777, Cl. 220-277.000.

Pfaffle, Ernst, to Hans Sickinger Co. Coil binding machine. 3,924,664, Cl. 140-92.700.

Pfeifle, Dieter, to SKF Kugellagerfabriken GmbH. Thread storage device. 3,924,818, Cl. 242-47.050.

Pfisterer, Herman: *See—*
Eberspaecher, Otto; and Pfisterer, Herman, 3,925,678.

Pfizer Inc.: *See—*
Hamsher, James J., 3,925,157.
Richards, Hugh Colin, 3,925,391.
Welch, Willard M., Jr.; and Harbert, Charles A., 3,925,409.

Phelan, Harry R., to Radiation Incorporated. Antenna arrays of internally phased elements. 3,925,784, Cl. 343-754.000.

Philbrick, John W.; and Wuestenhoefer, William C., to International Business Machines Corporation. Method for vapor deposition of gallium arsenide phosphide upon gallium arsenide substrates. 3,925,119, Cl. 148-175.000.

Phillips, Herbert L.: *See—*
Bloom, Ray A.; and Phillips, Herbert L., 3,925,060.

Phillips Petroleum Company: *See—*
Cheng, Paul J., 3,925,045.
Constantikes, George J.; and Van Pool, Joe, 3,925,193.

Cox, Ralph, 3,925,258.
Fahey, Darryl R., 3,925,494.
Harper, Ernest A., 3,925,047.
Hsieh, Henry, 3,925,317.
Kinney, Alfred W., 3,924,384.
Kosinsky, Edward J., 3,924,997.
Pitzer, Emory W., 3,925,499.
Rees, Robert L., 3,925,530.
Smith, Ernest L., 3,924,795.
Vives, Van C., 3,925,374.

Phillips, Thomas Richard, to Du Pont de Nemours, E. I., and Company. Anhydride acrylic copolymers as additives for unsaturated polyester molding compositions. 3,925,299, Cl. 260-40.00R.

Phillips, Woodrow W. Particle build up suppressor. 3,924,901, Cl. 302-64.000.

Photocircuits Division of Kollmorgen Corporation: *See*—
Polichette, Joseph; Leech, Edward J.; and Nuzzi, Francis J., 3,925,578.

Piasio, Roger N.; and Woiszwillo, James E., to Corning Glass Works. Labelled digoxin derivatives for radioimmunoassay. 3,925,355, Cl. 260-210.500.

Picciochi, Andrew V. Safety means for audio speakers. 3,925,708, Cl. 317-13.00R.

Picker Electronics, Inc.: *See*—
Meyer, Edward P.; and Wright, William L., 3,924,452.

Pifferi, Giorgio: *See*—
Carpi, Carlo; Dorigotti, Luciano; and Pifferi, Giorgio, 3,925,381.

Pigeon, Norbert G. Vehicle towing device. 3,924,763, Cl. 214-86.00A.

Pilc, Randolph John: *See*—
Cardwell, Robert Edward; Carlson, David Emory; Davis, Robert Leon; McNamara, Edward Joseph; Pilc, Randolph John; Schlanger, Gabriel Gary; Tutelman, David Morris; Warwick, Peter Stephen; and Zydney, Herbert Mortimer, 3,925,601.

Pilz, William M.: *See*—
Gardner, Jeffrey M.; and Pilz, William M., 3,924,734.

Pioneer Electronic Corporation: *See*—
Sato, Takashi, 3,925,617.

Pirard, Joseph Jean Julien: *See*—
Dechambre, Jean Theophile Fortunat; Lousberg, Pierre Jean Simon; and Pirard, Joseph Jean Julien, 3,924,499.

Pissiotas, Georg; Meyer, Willy; Bohner, Beat; and Drabek, Jozef, to Ciba-Geigy Corporation. Phosphorylformamidines. 3,925,517, Cl. 260-944.000.

Pitner, Alfred, to Nadella S.A., a part interest. Rolling bearing capable of fixing the axial position of a machine element. 3,924,912, Cl. 308-212.000.

Pitney-Bowes, Inc.: *See*—
Hubbard, David W.; and Coville, William W., 3,924,532.
Koeleman, Geradus A. J.; and op de Laak, Johannes H. A., 3,924,567.

Pitzer, Emory W., to Philiips Petroleum Company. Oxidative dehydrogenation using group IA or IIA metal Sn/P/O catalyst. 3,925,499, Cl. 260-680.00E.

Platt, Dan: *See*—
Thaler, Arnold; and Platt, Dan, 3,924,294.

Plevyak, Joseph B. Swing roll tool assembly. 3,924,430, Cl. 72-85.000.

Ploger, Walter; Schmidt-Dunker, Manfred; and Gloxhuber, Christian, to Henkel & Cie G.m.b.H. Cyclic aminophosphonic acids. 3,925,456, Cl. 260-502.500.

Podgajny, Thaddeus W., to General Steel Industries, Inc. Railway vehicle truck. 3,924,540, Cl. 105-197.00R.

Polaroid Corporation: *See*—
Chiklis, Charles K., 3,925,081.
Fielding, Herbert L.; and Liggero, Samuel H., 3,925,082.
Fitzgerald, Maurice J., 3,925,083.
Huyffer, Paul S., 3,925,347.
Scibilia, Peter A., 3,924,940.
Whall, James M., 3,925,800.
Wilson, Stewart W.; and Ericson, John W., 3,924,339.

Polichette, Joseph; Leech, Edward J.; and Nuzzi, Francis J., to Photocircuits Division of Kollmorgen Corporation. Sensitized substrates for chemical metallization. 3,925,578, Cl. 427-304.000.

Pollert, Wolfgang, to Motoren- und Turbinen-Union Munchen GmbH. Apparatus for adjusting fan blades in a turbojet engine. 3,924,404, Cl. 60-226.00R.

Poncin, Roger, to Elphiac S.A. Process for the manufacture of crankshafts. 3,924,439, Cl. 72-342.000.

Popov, Encho Nikolov; Diakov, Nikola Ganev; Dobreva-Dimitrova, Emilia; Apostolov, Roumen Konstantinov; and Hristov, Hristo Petkov, to DSO "Elprom". Statorless dynamo-electric machine. 3,925,696, Cl. 310-242.000.

Popov, Valery Georgievich: *See*—
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Chekotilo, Leonty Vasilievich; Martyn, Viktor Mikhailovich; Artamonov, Viktor Leonidovich; Bochorishvili, Anzor Ippolitovich; Stupak, Leonid Mikhailovich; Sysenko, Anatoly Petrovich; and Popov, Valery Georgievich, 3,924,672.

Porath, Jerker Olof; and Janson, Jan-Christer, to Exploaterings Aktiebolaget T.B.F. Virus separation. 3,925,152, Cl. 195-1.500.

Pormale, Milda Yanovna; Kashkina, Nadezhda Alexandrovna; Veinberg, Elfrida Indrikovna; Kalninsh, Arvid Yanovich; Shusters, Janis; Mikazhans, Valdis Danielovich; Purvinsh, Indulis Valdovich; and Skutelis, Antons Petrovich. High-molecular derivative of 2-dimethylaminoethyl ester of p-butylaminobenzoic acid, method for preparing same and application thereof. 3,925,356, Cl. 260-214.000.

Porret, Daniel; and Habermeier, Jurgen, to Ciba-Geigy Corporation. Dialkoxyphosphonomethyl derivatives of hydantoins. 3,925,406, Cl. 260-309.500.

Portelance, William. Crank movement mechanism. 3,924,477, Cl. 74-44.000.

Posokhin, Viktor Vladimirovich: *See*—
Mogilevsky, Vitaly Moritsovich; Deriga, Nikolai Filippovich; Ekimov, Vadim Petrovich; Erastov, Alexandr Petrovich; Posokhin, Viktor Vladimirovich; and Furer, Benya Elievich, 3,925,725.

Postma, Lambertus, to U.S. Philips Corporation. Multi-layered photosensitive material having glass substrate and method of manufacture. 3,925,080, Cl. 96-67.000.

Potier, Curtis N.: *See*—
Kroger, Harry; and Potier, Curtis N., 3,925,078.

Poupitch, Ouglјesa Jules, to Illinois Tool Works Inc. Multipackage device for containers and method for making same. 3,924,738, Cl. 206-150.000.

PPG Industries, Inc.: *See*—
Fahey, Dennis M., 3,925,286.
Hummel, Merritt J., 3,925,052.
Jerabek, Robert D., 3,925,180.
Lawhon, Robert A., 3,925,051.
Schwenninger, Ronald L., 3,925,049.

Prematta, Robert Joseph; and Venkatesan, Peruvemba Swaminatha, to Western Electric Company, Inc. Superplastic alloy of tin and zinc. 3,925,110, Cl. 148-11.50R.

Prenner, Amnon; Bear, Jacob; Tohar, David; and Koplin, Harry, to Koplin, Harry. Device for use in the completion of an oil or gas well. 3,924,677, Cl. 166-100.000.

Presearch Incorporated: *See*—
Brown, Buck C., 3,925,650.

Pressman, D. R.: *See*—
Clark, Lloyd Douglas, 3,925,777.

Pretini, Gisberto. Anti robbery protection equipment. 3,924,546, Cl. 109-3.000.

Pretorius, Hillius, to Jet Ball (Eiendoms) Deperk. Tethered ball apparatus. 3,924,855, Cl. 273-95.0AA.

Pribadi, Krishnahadi Sikun: *See*—
Wadhwani, Romesh Tekchand; and Pribadi, Krishnahadi Sikun, 3,925,763.

Price, Roger W., to NeeTree Corporation. Means for disposing of christmas trees. 3,924,669, Cl. 150-52.00R.

Primicerio, Fernando; and Benigno, Paolo, to Minnesota Mining and Manufacturing Company. Box for magnetic tape cassette. 3,924,742, Cl. 206-387.000.

Princeton Chemical Research, Inc.: *See*—
Magder, Jules; and Reich, Murray H., 3,925,302.

Princeton Electronic Products, Inc.: *See*—
Hofstein, Steven R., 3,925,702.

Procter & Gamble Company, The: *See*—
Koepfle, Frank Xavier; and Grote, Herbert Edward, 3,925,230.
Laughlin, Robert Gene; and Stewart, Robert Lee, 3,925,262.

Product-Sol, Inc.: *See*—
Bergishagen, Finn; and Schmidt, James J., 3,924,455.

Produits Chimiques Ugine Kuhlmann: *See*—
Bader, Andre A.; and Weiss, Francis J., 3,925,493.
Riess, Jean G.; Le Blanc, Maurice; Santini, Georges; and Guion, Jacky, 3,925,491.

Pun, John Y.: *See*—
Dempster, Philip T.; and Pun, John Y., 3,924,612.

Purcell, Robert J., to Caterpillar Tractor Co. Equalizer bar assembly for crawler-type vehicles. 3,924,703, Cl. 180-9.540.

Purvinsh, Indulis Valdovich: *See*—
Pormale, Milda Yanovna; Kashkina, Nadezhda Alexandrovna; Veinberg, Elfrida Indrikovna; Kalninsh, Arvid Yanovich; Shusters, Janis; Mikazhans, Valdis Danielovich; Purvinsh, Indulis Valdovich; and Skutelis, Antons Petrovich, 3,925,356.

Putney, David H.; and Graham, Ward A., to Stratford Engineering Corporation. Hydrogen fluoride alkylation with effluent refrigeration. 3,925,501, Cl. 260-683.480.

Putterman, Harry: *See*—
Witteles, Abraham A.; and Putterman, Harry, 3,925,767.

Puyplat, Olivier, to Cibie Projecteurs. Cleaning device e.g. for vehicle headlight lens. 3,924,290, Cl. 15-250.040.

Quaadvliet, Hendricus Johannes Adrianus, to Stichting Reactor Centrum Nederland. Lattice for supporting a bunch of bar-shaped members. 3,924,380, Cl. 52-664.000.

Quaker Oats Company, The: *See*—
Reinhart, Robert R.; and Smith, George M., Jr., 3,925,565.
Reinhart, Robert R.; and Sair, Louis, 3,925,566.

Quasar Electronics Corporation: *See*—
Griffey, Donald E., 3,925,716.

Quick, Donald Jonathon, to Massey-Ferguson Services N.V. Trash removal apparatus for sugar cane harvesters. 3,925,199, Cl. 209-3.000.

R. W. Mac Company: *See*—
MacDonnell, Robert W.; and Shander, Otto A., 3,924,541.
Mac Donnell, Robert W.; and Shander, Otto A., 3,924,542.

Rabinowitz, Azriel J.; and Wilson, David B., to Sybron Corporation. Dental chair backrest with integral elbow supports. 3,924,894, Cl. 297-460.000.

Raby, Virgil W., to General Motors Corporation. Rotor resistor and fan for AC induction motor. 3,925,695, Cl. 310-72.000.

Radiation Incorporated: *See*—
Phelan, Harry R., 3,925,784.

Radielovic, Dragutin: *See*—
Wanmaker, Willem Lambertus; and Radielovic, Dragutin, 3,925,239.

Radlmann, Eduard: *See*—
Bernert, Claus-Rudiger; and Radlmann, Eduard, 3,925,321.

Raeymaekers, Alfons Herman Margaretha: *See*—
Van Gelder, Josephus Ludovicus Hubertus; Raeymaekers, Alfons Herman Margaretha; Roevens, Leopold Frans Corneel; and Van Laerhoven, Willey Joannes, 3,925,383.

Raffel, Reiner: *See*—
Althausen, Ferdinand; Boden, Heinrich; Ersfeld, Heinz; Klier, Lothar; Raffel, Reiner; and Schneider, Walter, 3,924,989.

Rafferty, James B.: *See*—
Clark, John O.; Rafferty, James B.; and Schindler, Donald G., 3,924,453.

Rai-Choudhury, Prosenjit, to Westinghouse Electric Corporation. Silicon semiconductor device with stress-free electrodes. 3,925,808, Cl. 357-67.000.

Raider, Jerry W.: *See*—
Kuhn, Robert F.; Lyons, Theodore F.; and Raider, Jerry W., 3,924,725.

Raider, Stanley I.: *See*—
Gdula, Robert A.; Raider, Stanley I.; and Revitz, Martin, 3,925,107.

Rain Bird Sprinkler, Mfg. Corporation: *See*—
Troup, Edward M., 3,924,809.

Raison, Michel, to Compagnie Generale d'Automatisme. Suspended suction or fill pipe for handling fluid products or the like. 3,924,666, Cl. 141-231.000.

Randall, John M.; Hautala, Earl; Waiss, Anthony C., Jr.; and Kuhnle, Judith A., to United States of America, Agriculture. Removing heavy metal ions from water. 3,925,192, Cl. 210-38.000.

Ranft, Ernst L.: *See*—
Beiswenger, David W.; Paddock, Gordon R.; and Ranft, Ernst L., 3,924,408.
Heilman, Gerald D.; Paddock, Gordon R.; and Ranft, Ernst L., 3,924,409.

Ranz, Erwin: *See*—
Meyer, Rudolf; and Ranz, Erwin, 3,924,946.

Rao, Ganta V.; and Gerrish, Oliver B., Sr., to Far-Mar-Co., Inc. Process for fortifying food and feed products with amino acids. 3,925,568, Cl. 426-618.000.

Rapid-American Corporation: *See*—
Bernard, James K.; and Sollazzi, Pasquale Robert, 3,924,714.
Sollazzi, Pasquale Robert; and Kaufman, Michael Avrum, 3,924,872.

Rasmussen, Chris Royce, to McNeil Laboratories, Incorporated. Benzothiazine-1,1-dioxides. 3,925,371, Cl. 260-243.00R.

Rau, Karlheinz; and Seiler, Karl, to Heraeus-Schott Quarzschmelze GmbH. Composite quartz glass body. 3,925,583, Cl. 428-36.000.

Rau, Wolfgang: *See*—
Mueller-Tamm, Heinz; Schick, Hannes; Rau, Wolfgang; and Hennenberger, Peter, 3,925,341.

Rauch, Marvin A.; Boni, Raymond L.; and Hadnagy, Thomas D. Intraoral fusion process. 3,924,332, Cl. 32-14.00R.

Rausing, Gad Anders; Stark, Sven Olof Soren; and Sevrell, Sven Gosta Uno, to Tetra Pak Developpement SA. Packaging containers. 3,924,796, Cl. 229-17.00G.

Rawlins, Charles B., to Aluminum Company of America. Suppression of wake-induced oscillations in a conductor bundle. 3,925,594, Cl. 174-42.000.

Rayburn, Russell L.: *See*—
Scheminske, Dennis L.; and Rayburn, Russell L., 3,924,939.

Raychem Corporation: *See*—
Dahl, Klaus Joachim; and Kameda, Floyd Masato, 3,925,307.
Siden, Dennis C., 3,925,596.

Raymond Lee Organization, Inc., The: *See*—
Christensen, David E., 3,924,857.
Gonzalez, Luis G., 3,924,735.
Irwin, Fred, 3,924,602.

RCA Corporation: *See*—
Fischbeck, Kenneth Henry; and Leyton, Eric McPhail, deceased, 3,924,974.
Fishbeck, Kenneth Henry, 3,925,790.
Gale, Michael Thomas; and Greenaway, David, 3,924,925.
Gavrilovic, Dragan Milan, 3,925,238.
Goldmacher, Joel Edward; and McCaffrey, Michael Thomas, 3,925,236.
Kalfus, Martin Aaron, 3,925,688.
Levine, Peter Alan, 3,925,657.
Ross, Daniel Louis; and Gavrilovic, Dragan Milan, 3,925,237.
Trevail, Lewis Herbert; and Hegarty, Brian Anthony, 3,924,323.
White, Joseph Paul; and Del Priore, Paul Joseph, 3,924,361.
Wittlinger, Harold Allen, 3,925,718.

Reading, William H., III: *See*—
Friedenberg, Robert; Reese, William; and Reading, William H., III, 3,924,609.

Reamey, Herbert K.; and Newman, Jerry F., to Reynolds Metals Company. Joint ramming cement. 3,925,092, Cl. 106-281.00R.

Reaville, Eric T.: *See*—
Heimsch, Robert A.; and Reaville, Eric T., 3,925,076.

Rebeille, Jean-Claude: *See*—
Agouri, Elias; Favie, Claude; and Rebeille, Jean-Claude, 3,925,508.

Redactron Corporation: *See*—
Cohen, William D.; and Darcy, John J., 3,924,823.

Redifon Limited: *See*—
Pedlar, Roy; and Boustred, Brian Malcolm, 3,924,342.

Reed, David A., to Harris-Intertype Corporation. Collating method and apparatus. 3,924,846, Cl. 270-56.000.

Rees, Robert L., to Phillips Petroleum Company. Release coating for molds. 3,925,530, Cl. 264-297.000.

Reese, William: *See*—
Friedenberg, Robert; Reese, William; and Reading, William H., III, 3,924,609.

Regie Nationale des Usines Renault: *See*—
Lefeuvre, Andre, 3,924,875.

Rehberg, Rolf: *See*—
Papenfuss, Theodor; Rehberg, Rolf; and Spietschka, Ernst, 3,925,094.

Reich, Manfred; Muller, Wolfgang; and zur Hausen, Manfred, to Chemische Werke Huls Aktiengesellschaft. Hydrogenation catalysts and process for the removal of aldehydes and ketones from gaseous streams rich in carbon monoxide. 3,925,490, Cl. 260-643.00B.

Reich, Murray H.: *See*—
Magder, Jules; and Reich, Murray H., 3,925,302.

Reinert, Milton J., to United States of America, Air Force. Rotatable window means. 3,924,826, Cl. 244-129.00W.

Reinhart, Richard D.: *See*—
Straughn, Robert O.; Elofson, Gary L.; and Reinhart, Richard D., 3,925,563.

Reinhart, Robert R.; and Smith, George M., Jr., to Quaker Oats Company, The. Simulated meat product. 3,925,565, Cl. 426-447.000.

Reinhart, Robert R.; and Sair, Louis, to Quaker Oats Company, The; and Griffith Laboratories, Inc., The. Simulated meat product. 3,925,566, Cl. 426-447.000.

Reinke, Friedhelm; Stengel, Edgar; and Emde, Friedhelm, to AEG-Elotherm G.m.b.H. Method of coating metallic material onto a metallic substrate. 3,925,570, Cl. 427-46.000.

Reis, Walter; and Boll, Dietmar, to Walter Reis. Apparatus for transporting workpieces. 3,924,754, Cl. 214-1.0BD.

Reliance Electric Company: *See*—
Kitaoka, Hiroo, 3,924,906.

Relyveld, Edgar Hans, to Institut Pasteur. Process for preparing adsorbed vaccines. 3,925,545, Cl. 424-92.000.

Remond, Georges: *See*—
Vincent, Michel; Remond, Georges; and Laubie, Michel, 3,925,369.

Renner, Alfred; and Haug, Theobald, to Ciba-Geigy Corporation. Storage-stable compositions of polyimides and azomethines. 3,925,314, Cl. 260-47.0UA.

Renner, Edmund W., Jr.; Sule, Frank P.; and Sule, Wayne P. Signalling device for preventing spill-over from the fuel tanks of powered boats during filling. 3,924,559, Cl. 116-109.000.

Renner, Hermann; and Barenyi, Bela, to Daimler-Benz Aktiengesellschaft. Safety instrument panel for motor vehicles. 3,924,707, Cl. 180-90.000.

Renner, Hermann: *See*—
Barenyi, Bela; and Renner, Hermann, 3,924,874.

Rennick, John L., to Zenith Radio Corporation. Dropout detector for video disc playback. 3,925,605, Cl. 178-6.60R.

Rennie, Robert Allan Campbell: *See*—
Crosby, John; Paton, Robert Michael; and Rennie, Robert Allan Campbell, 3,925,435.

Repapress AG: *See*—
Hirmann, Georg, 3,924,843.

Research Abrasive Products, Inc.: *See*—
Anna, Leo A.; and Dixon, Kenneth C., 3,925,034.

Research Corporation: *See*—
Story, Paul Richard; Busch, Peter; Denson, Donald Derby; and Wright, Carl Edward, 3,925,421.
Swallow, Ronald J., 3,925,776.

Resources Conservation Co.: *See*—
Ames, Robert K., 3,925,201.

Revitz, Martin: *See*—
Gdula, Robert A.; Raider, Stanley I.; and Revitz, Martin, 3,925,107.

Reymore, Harold E., Jr.: *See*—
Carleton, Peter S.; Lockwood, Robert J.; and Reymore, Harold E., Jr., 3,925,284.

Reynolds Metals Company: *See*—
Bruen, Charles P.; and Kelly, Donald H., 3,925,538.
Reamey, Herbert K.; and Newman, Jerry F., 3,925,092.

Reynolds, Robert J., to Burroughs Corporation. Digital logic and servo system for print head rotate control. 3,924,721, Cl. 197-18.000.

Rhee, Jhoon Goo: *See*—
Allen, George H.; and Rhee, Jhoon Goo, 3,924,272.

Rhone-Poulenc S.A.: *See*—
Brunie, Jean-Claude; Creene, Noel; and Maurel, Felix, 3,925,316.
Chabardes, Pierre; Grard, Charles; and Schneider, Charles, 3,925,485.
Gerard, Bernard, 3,925,324.
Janin, Raymond, 3,925,401.
Rio, Andre; and Vivant, Gilbert, 3,925,303.
Sagi, Ferenc; and Roussos, Michel, 3,925,242.
Tchelitcheff, Serge, 3,925,550.

Richards, Elmer A., to Eaton Corporation. Sensor unblocking ramps. 3,924,484, Cl. 74-331.000.

Richards, Ernest Levon, to Deering Milliken Research Corporation. Wet mop head construction. 3,924,289, Cl. 15-229.0AC.

Richards, Hugh Colin, to Pfizer Inc. 2-Aminoalkyl tetrahydroquinolines. 3,925,391, Cl. 260-288.00R.

Richards, John Alan: *See—*
Hiller, John Barry; Richards, John Alan; and Huey, Richard Meredyth, 3,925,663.
Richardson, Richard L.; Hildebrand, Bernard P.; and Mahan, Robert E., to Battelle Memorial Institute. Information and process control enhancement system employing series of square wave components. 3,925,646, Cl. 235-152.000.
Richmond, Richard Malcolm, to Shoe & Allied Trades Research Association, The. Automatically guiding workpieces through a machine. 3,925,713, Cl. 318-575.000.
Richter, Martin; and Kroger, Ingo, to Siemens Aktiengesellschaft. Arrangement for the transmission of control commands from a stationary part to a rotating part of an electric machine. 3,925,694, Cl. 310-68.00D.
Richtzenhain, Hermann: *See—*
Riegger, Paul; and Richtzenhain, Hermann, 3,925,424.
Riegger, Paul; and Richtzenhain, Hermann. Process for preparing 4-chloroformyl phthalic acid anhydride. 3,925,424, Cl. 260-346.300.
Riess, Jean G.; Le Blanc, Maurice; Santini, Georges; and Guion, Jacky, to Produits Chimiques Ugine Kuhlmann. New fluorinated dienes and process for preparing same. 3,925,491, Cl. 260-653.300.
Riggs, John P.: *See—*
Kimmel, Robert M.; Riggs, John P.; Swander, Robert W.; and Whitney, Wells, 3,925,524.
Riha, Petr: *See—*
Kovar, Stanislav; Cernocky, Jiri; and Riha, Petr, 3,924,820.
Rinck, Friedrich Karl: *See—*
Moroni, Rolf; Rinck, Friedrich Karl; and Ehlenz, Peter, 3,925,248.
Ringel, Paul; Hildebrand, Dietrich; and Breidbach, Gunter, to Bayer Aktiengesellschaft. Process for dyeing fibre material containing NH-groups from organic solvents. 3,925,012, Cl. 8-169.000.
Rio, Andre; and Vivant, Gilbert, to Rhone-Poulenc S.A. Flameproofing of acrylonitrile polymers and copolymers. 3,925,303, Cl. 260-45.70P.
Ripka, Josef: *See—*
Esser, Miroslav; Ledr, Zdenek; Ferkl, Frantisek; Kubovy, Miloslav; Ripka, Josef; Hortlik, Frantisek; and Elias, Jiri, 3,924,398.
Risdon Manufacturing Company, The: *See—*
Starrett, Rupert M., 3,924,782.
Ritchie, Donald D.: *See—*
Bultman, John D.; Jurd, Leonard; and Ritchie, Donald D., 3,925,558.
Ritzi, Jack Henry, to W. R. Grace & Co. Water dispersable chlorinated solvent and method. 3,925,231, Cl. 252-171.000.
Riverby Farms, Inc.: *See—*
Thomas, Wil B.; and Boggs, Fred, 3,924,573.
Riverside Bio-Engineering, Inc.: *See—*
Bliss, Richard D., 3,925,604.
Roantree, James P.; and Saunders, John, to United Technologies Corporation. Strapdown gyro drift calculator. 3,925,642, Cl. 235-150.250.
Roantree, James P.; Saunders, John; and Baum, Robert A., to United Technologies Corporation. Drift correcting gyro system using filters. 3,925,643, Cl. 235-150.250.
Roantree, James P.; and Saunders, John, to United Technologies Corporation. Digital sine wave synthesizer. 3,925,654, Cl. 235-197.000.
Robbins, Joseph: *See—*
Earle, Harold Westly; and Robbins, Joseph, 3,925,624.
Robert Bosch G.m.b.H.: *See—*
Hess, Johann; Paule, Kurt; Latzina, Kurt; and Wolf, Richard, 3,924,961.
Rometsch, Werner; and Veil, Karl, 3,924,969.
Schwerin, Gunther, 3,924,655.
Roberts, Michael G.; and Chase, Kenneth P., to Owens-Corning Fiberglas Corporation. Molding compounds and method of making same. 3,925,300, Cl. 260-40.00R.
Robertson, Malcolm Eric Alexander; Marshall, John; Brabants, Jules Anthony Peter; and Davies, Michael Edward, to D.A. Pitman Limited. Thermoluminescence Dosimeter Reader. 3,925,665, Cl. 250-337.000.
Robertson, Thomas J. Labial muscle exerciser. 3,924,850, Cl. 272-57.00H.
Robins, Roland K.: *See—*
O'Brien, Darrell E.; Robins, Roland K.; and Springer, Robert H., 3,925,385.
Robinson, Ralph C., to General Time Corporation. Digital alarm clock. 3,924,399, Cl. 58-16.00D.
Robinson, Stephen Perrin, to Ansafone Limited. Telephone apparatus. 3,925,622, Cl. 179-18.0BE.
Robson, Robert: *See—*
Jervis, Graham James; and Robson, Robert, 3,925,215.
Rockwell International Corporation: *See—*
Budzyna, Edward S., 3,924,662.
George, Peter K., 3,925,769.
Spence, John R., 3,925,690.
Tu, Peter K. C.; Brooke, Alan H.; and Miller, Frank S., 3,925,044.
Rodewald, Paul G.; and Whitehurst, Darrell D., to Mobil Oil Corporation. Hydrocarbon conversion with catalyst of SbF_5 on silica. 3,925,194, Cl. 208-109.000.
Rodewald, Paul G.; and Whitehurst, Darrell D., to Mobil Oil Corporation. Antimony pentafluoride hydrocarbon conversion catalyst. 3,925,251, Cl. 252-441.000.
Rodewald, Paul G., to Mobil Oil Corporation. Hydrocarbon conversion in the presence of a catalyst of a lewis acid intercalated in graphite. 3,925,495, Cl. 260-666.00P.
Rodgers, Franklin A., to Pactide Corporation. Multi-stage disposable still. 3,925,167, Cl. 202-174.000.
Rodi, Anton, to Teldix GmbH. Circuit for selecting an extreme value. 3,925,719, Cl. 323-16.000.
Rodriguez, Sergio E.: *See—*
Nebeker, Eugene B.; and Rodriguez, Sergio E., 3,924,805.
Roeschlau, Peter: *See—*
Beaucamp, Klaus; Mollering, Hans; Lang, Gunter; Gruber, Wolfgang; and Roeschlau, Peter, 3,925,164.
Roesler, David F.: *See—*
Lamer, Gerald P.; Zyduck, Ronald L.; and Roesler, David F., 3,924,753.
Roest, Bernard C.; and Schepers, Herman A. J., to Stamicarbon N.V. Process for the preparation of block copolymers containing α-methylstyrene. 3,925,512, Cl. 260-880.00B.
Roevens, Leopold Frans Corneel: *See—*
Van Gelder, Josephus Ludovicus Hubertus; Raeymaekers, Alfons Herman Margaretha; Roevens, Leopold Frans Corneel; and Van Laerhoven, Willey Joannes, 3,925,383.
Rogers, Wesley A.: *See—*
Auman, John T.; Rogers, Wesley A.; and Jones, Trevor O., 3,925,753.
Rohm & Haas Company: *See—*
Kilbourn, Edward E.; and Weiler, Ernest D., 3,925,397.
Rohr, Harry: *See—*
Muller, Karl-Heinz; Rohr, Harry; and Ott, Karl-Heinz, 3,925,528.
Rohr, Wolfgang: *See—*
Fischer, Adolf; Hamprecht, Gerhard; Mangold, Dietrich; and Rohr, Wolfgang, 3,925,439.
Rohrbach, Phillippe: *See—*
Gastambide, Bernard; Thal, Claude; Rohrbach, Phillippe; and Laroche, Marie-Jeanne, 3,925,480.
Rolf, David A.; and Chance, Vernon B., Jr., to Universal Oil Products Company. Method of sol manufacture. 3,925,256, Cl. 252-463.000.
Roll-Rite Corporation: *See—*
Christensen, Carl O., 3,924,292.
Rolland, Jacques Robert: *See—*
Hampton, Richard John; Rolland, Jacques Robert; and Gallo, Thomas, 3,925,343.
Rolls-Royce (1971) Limited: *See—*
Duggan, Matthew, 3,925,640.
Romano, Roberto: *See—*
Stone, Louis Earl; and Romano, Roberto, 3,925,117.
Rometsch, Werner; and Veil, Karl, to Robert Bosch G.m.b.H. Hydraulic system. 3,924,969, Cl. 417-218.000.
Rongved, Leif: *See—*
Firtion, Victor Andrew; Rongved, Leif; and Saunders, Thomas Edward, 3,925,785.
Roos, Dewey A.; Lawlor, Kenneth A.; and Abadie, Erwin I., to United States of America, Navy. Pulse generating circuit. 3,924,535, Cl. 102-70.20R.
Rose, Dale P., to General Motors Corporation. Rotary engine anti-spin oil seal. 3,924,979, Cl. 418-142.000.
Rosemund, Walter Richard; Sandner, Michael Ray; and Trecker, David John, to Union Carbide Corporation. Beta-amino nitrile catalysts for polyurethane preparation. 3,925,268, Cl. 260-2.5AC.
Rosenbaum, Walter Steven: *See—*
Chaires, Anne Marie; Ciconte, Jean Marie; Ett, Allen Harold; Hilliard, John Joseph; and Rosenbaum, Walter Steven, 3,925,761.
Rosenberger, Michael: *See—*
Cohen, Noal; Rosenberger, Michael; and Saucy, Gabriel, 3,925,420.
Ross, Daniel Louis; and Gavrilovic, Dragan Milan, to RCA Corporation. Novel liquid crystal electro-optic devices. 3,925,237, Cl. 252-299.000.
Rothbuhr, Lothar: *See—*
Engel, Claus Richard; Linke, Heinz; Rothbuhr, Lothar; Sroka, Werner; Vogt, Jes; and Westlinning, Hermann, 3,925,301.
Roumazeilles, Simonne: *See—*
Lazarre, Flavien; Rozand, Jacques; and Roumazeilles, Simonne, 3,924,658.
Roussel-UCLAF: *See—*
Clemence, Francois; and Le Martret, Odile, 3,925,399.
Heurtaux, Simone; and Costerousse, Germain, 3,925,393.
Roussos, Michel: *See—*
Sagi, Ferenc; and Roussos, Michel, 3,925,242.
Rover Company Limited, The: *See—*
Crouch, Stephen John, 3,924,873.
Rowland Development Corporation: *See—*
Rowland, William P., 3,924,958.
Rowland, William P., to Rowland Development Corporation. Highway retroreflecting marker. 3,924,958, Cl. 404-15.000.
Rowton, Richard Lee, to Jefferson Chemical Company, Inc. Reduction of acidity of organic polymeric isocyanates. 3,925,437, Cl. 260-453.0SP.
Rozand, Jacques: *See—*
Lazarre, Flavien; Rozand, Jacques; and Roumazeilles, Simonne, 3,924,658.
Rubenstein, Richard B., to General Instrument Corporation. High speed data buffer and amplifier. 3,925,689, Cl. 307-260.000.
Rubio, Alfred M.: *See—*
Cohen, Morris; Cohen, Evelyn V.; and Rubio, Alfred M., 3,924,501.
Rudolph, Hans: *See—*
Bockmann, August; Teichmann, Gunter; and Rudolph, Hans, 3,925,095.

Ruehling, Barry W.: *See—*
Cricchi, James Ronald; and Ruehling, Barry W., 3,925,804.
Rupert, Robert E.: *See—*
Anderson, Norman C.; and Rupert, Robert E., 3,925,668.
Rupp, Karl: *See—*
Althuber, Horst; and Rupp, Karl, 3,925,817.
Russell, Robert L., to TRW Inc. Radiation hard solar cell and array. 3,925,103, Cl. 136-202.000.
Ruthart, Leonard Crawford; and Williams, Virgil Lynn. Apparatus for dispensing, measuring, coating and cutting sheet material. 3,924,561, Cl. 118-9.000.
Rutledge, Thomas F.; and Zech, John D., to ICI United States Inc. Fatty group containing methylolated, polyoxyalkylene carbamates and textile materials softened by treatment therewith. 3,925,009, Cl. 8-115.700.
Ryan, John W.: *See—*
Dekan, Howard L.; and Ryan, John W., 3,924,856.
Rye, Grover W.: *See—*
Hunter, Edward E.; and Rye, Grover W., 3,924,569.
Saari, Oliver Edward, to Illinois Tool Works Inc. Fastener driving tool. 3,924,692, Cl. 173-117.000.
SAFT-Societe des Accumulateurs Fixes et de Traction: *See—*
Lehmann, Gerard; and Brych, Alfred, 3,925,101.
Sagi, Ferenc; and Roussos, Michel, to Rhone-Poulenc S.A. Process for reducing foaming of liquids susceptible to foaming. 3,925,242, Cl. 252-321.000.
Saida, Hiroji; Ono, Yuichi; Nomura, Masayoshi; Tamura, Masao; and Kozuka, Hirotsugu, to Hitachi, Ltd. A method for manufacturing a semiconductor device having a buried epitaxial layer. 3,925,120, Cl. 148-175.000.
Sair, Louis: *See—*
Reinhart, Robert R.; and Sair, Louis, 3,925,566.
Saito, Etsuro, to Sony Corporation. Pick-up arm assembly. 3,924,860, Cl. 274-1.00L.
Saito, Noboru: *See—*
Mitsuhashi, Shigeru; Hirokawa, Kyoichi; Saito, Noboru; Kaneko, Minoru; Shoji, Michihiro; Kowada, Masunari; and Kazama, Yasuo, 3,924,330.
Saito, Yuji, to Nippon Electric Company Limited. Shadow mask for a black-stripe color picture tube having successively curved perforations. 3,925,700, Cl. 313-403.000.
Sakai, Kiyoshi; Inoue, Kenji; Tajima, Yawara; Yamazaki, Mitsuo; Ohuchi, Kazuo; and Yusa, Takashi, to Sankyo Company Limited. 13,14-ξ-Methylene-15-oxoprostanoic acid derivatives. 3,925,451, Cl. 260-468.00D.
Sakato, aoyuki; and Nakamura, Hidetosi, to Shinetsu Chemical Company. Water-resistant adhesive compositions. 3,925,289, Cl. 260-29.60B.
Salete, Felipe. Automatic choke relief valves system for pneumatic conveyance. 3,924,899, Cl. 302-35.000.
Sally, Theodore J.: *See—*
Morris, Earl L.; and Sally, Theodore J., 3,924,279.
Salooja, Kailish Chander, to Exxon Research and Engineering Company. Placement of catalytically active materials in combustion flames. 3,925,001, Cl. 431-4.000.
Salsgiver, James A.; and Malagari, Frank A., to Allegheny Ludlum Industries, Inc. Process employing cooling in a static atmosphere for high permeability silicon steel comprising copper. 3,925,115, Cl. 148-112.000.
Samos: *See—*
de Habsburg, Dominic, 3,924,803.
Samour, Carlos M., to Kendall Company, The. Monomeric emulsion stabilizers. 3,925,442, Cl. 260-459.000.
Sample, Thomas E., Jr.; Hughes, James W.; and Tate, Jack F., to Texaco Inc. Scale control. 3,925,582, Cl. 427-385.000.
Sanada, Noriaki; and Sorimachi, Kanehiro, to Canon Kabushiki Kaisha. Film-advancing device for a camera. 3,925,798, Cl. 354-215.000.
Sander, Duane E., to Daktronics, Inc. Temperature measurement circuit. 3,924,470, Cl. 73-362.0AR.
Sanders, Christine C.: *See—*
Sanders, W. Eugene, Jr.; and Sanders, Christine C., 3,925,160.
Sanders, W. Eugene, Jr.; and Sanders, Christine C., to Creighton University. Method of producing an antibiotic. 3,925,160, Cl. 195-96.000.
Sandner, Michael Ray: *See—*
Rosemund, Walter Richard; Sandner, Michael Ray; and Trecker, David John, 3,925,268.
Sandor, Louis; Germain, Andrew Gerald; Wiles, Donald Ray; and Filippini, Ronald A., to Amsted Industries Incorporated. Mold stopper. 3,924,422, Cl. 164-304.000.
Sandoz, Inc.: *See—*
Cuthbertson, Edmond N.; and Davenport, Raymond, 3,925,273.
Houlihan, William J.; and Nadelson, Jeffrey, 3,925,476.
Oh, Hans, 3,925,548.
Ott, Hans, 3,925,549.
Sandoz Ltd.: *See—*
Schelling, Hans-Peter; and Schaub, Fritz, 3,925,429.
Sandoz-Wander, Inc.: *See—*
Buzzolini, Mario Gustav; and Manning, Robert Everett, 3,925,483.
San Juaquin, Jaime E. Anti-theft automobile door lock. 3,924,427, Cl. 70-264.000.
Sankyo Company Limited: *See—*
Sakai, Kiyoshi; Inoue, Kenji; Tajima, Yawara; Yamazaki, Mitsuo; Ohuchi, Kazuo; and Yusa, Takashi, 3,925,451.
Sano, Junzi: *See—*
Makino, Syoso; Hosokawa, Kenjiro; and Sano, Junzi, 3,925,008.
Santa Fe International Corporation: *See—*
Goren, Yoram; and Springett, Charles N., 3,924,415.
Santini, Georges: *See—*
Riess, Jean G.; Le Blanc, Maurice; Santini, Georges; and Guion, Jacky, 3,925,491.
Sanyo Chemical Industries, Ltd.: *See—*
Shibahara, Yasuo; and Tominaga, Yoichi, 3,925,328.
Sapp, Maurice. Fishing rod with storable stake. 3,924,345, Cl. 43-21.200.
Saran, Herbert: *See—*
Hachmann, Klaus; Saran, Herbert; and Sperling, Gerhard, 3,925,234.
Sardo, Alberto Carmelo, to Pennwalt Corporation. System for the handling of fruits and vegetables. 3,924,381. Cl. 53-3.000.
Sartori, Guido: *See—*
Valvassori, Alberto; Sartori, Guido; and Cameli, Nazzareno, 3,925,333.
Sartorius-Membranfilter GmbH: *See—*
Scriba, Peter C., 3,925,207.
Sarumaru, Kazumasa, to Kobe Machinery Company, Ltd. Apparatus for vulcanization-pressing of vehicular tire treads. 3,924,981, Cl. 425-24.000.
Sasajima, Kikuo: *See—*
Maruyama, Isamu; Nakao, Masaru; Sasajima, Kikuo; Ono, Keiichi; Takayama, Masaharu; Katayama, Shigenari; Tanaka, Yoshihiro; Yanagihara, Izumi; Inaba, Shigeho; and Yamamoto, Hisao, 3,925,387.
Sasaki, Kantaro: *See—*
Miura, Minoru; Kawasaki, Morio; Sasaki, Kantaro; Sugitani, Yasuo; and Ishimura, Susumu, 3,924,812.
Sashida, Akinobu: *See—*
Minakawa, Yoshinari; and Sashida, Akinobu, 3,924,821.
Satake, Yoshihiro, to Copal Company Limited. Voltage checking means for an electric circuit employing two power sources. 3,925,771, Cl. 340-249.000.
Sato, Akira; Shiba, Keisuke; and Hinata, Masanao, to Fuji Photo Film Co., Ltd. Direct-positive silver halide emulsion containing a cyanine dye having a pyrazolo[1,5-a]benzimidazole nucleus. 3,925,084, Cl. 96-101.000.
Sato, Akira; Ogawa, Akira; Shiba, Keisuke; and Hinato, Masanao, to Fuji Photo Film Co., Ltd. Direct positive silver halide emulsion. 3,925,085, Cl. 96-101.000.
Sato, Kiyotaka: *See—*
Ogura, Jiro; Seki, Ikuo; Sato, Kiyotaka; Takahashi, Masaaki; Ito, Akira; and Igarashi, Yuriko, 3,925,222.
Sato, Masao: *See—*
Takamura, Akira; Shimogori, Kazutoshi; Yamagata, Toshiaki; Sato, Masao; and Kitanata, Koziro, 3,925,064.
Sato, Takashi, to Pioneer Electronic Corporation. Telephone auto-answering device with time recording. 3,925,617, Cl. 179-6.00R.
Sato, Toshio: *See—*
Ohtsuka, Shuji; and Sato, Toshio, 3,925,741.
Satya, Akella V. S.: *See—*
Altman, Carl; Chapman, Sydney G.; and Satya, Akella V. S., 3,924,320.
Saucy, Gabriel: *See—*
Cohen, Noal; Rosenberger, Michael; and Saucy, Gabriel, 3,925,420.
Saunders, Alexander M., to Technicon Instruments Corporation. Method and apparatus for quantitative analysis utilizing particulate reagent material. 3,925,018, Cl. 23-230.00R.
Saunders, John: *See—*
Roantree, James P.; and Saunders, John, 3,925,642.
Roantree, James P.; Saunders, John; and Baum, Robert A., 3,925,643.
Roantree, James P.; and Saunders, John, 3,925,654.
Saunders, Richard C.; and Heredy, Laszlo A., to Electric Power Research Institute. Positive electrode for electrical energy storage device. 3,925,098, Cl. 136-6.0LF.
Saunders, Thomas Edward: *See—*
Firtion, Victor Andrew; Rongved, Leif; and Saunders, Thomas Edward, 3,925,785.
Saveth, Saul. Relatively flat blank for a container and the container made therefrom. 3,924,798, Cl. 229-23.0AB.
Sawada, Atsuo, to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha. Process for preparing granular ethylene-vinyl alcohol copolymer. 3,925,336, Cl. 260-87.300.
Sayigh, Adnan A. R.: *See—*
Knis, Stephen A.; and Sayigh, Adnan A. R., 3,924,837.
Scatoloni, Guido J. Electrode cleaning means in an electric water heater. 3,925,638, Cl. 219-295.000.
Schaafsma, Sijbrandus E.; and Deumens, Johannes J. M., to Stamicarbon B.V. Preparation of 3,4,5,6,7,8-hexahydrocoumarin. 3,925,422, Cl. 260-343.20R.
Schachet, Eli, to Sherwood Medical Industries Inc. Modular thoracic drainage device. 3,924,624, Cl. 128-276.000.
Schafer, Karl; Schuster, Hans; and Klebert, Wolfgang, to Bayer Aktiengesellschaft. Process for finishing textiles made of fibers which contain keratin. 3,925,581, Cl. 427-377.000.
Schaller, Robert L., to Sundstrand Syracuse, Inc. Centerless grinder with hydraulic drive. 3,924,359, Cl. 51-103.0TF.
Scharfe, Gerhard: *See—*
Swodenk, Wolfgang; and Scharfe, Gerhard, 3,925,452.

Scharrer, Roland Pierre Franz, to Arizona Chemical Company. Polymerization of unsaturated fatty materials. 3,925,342, Cl. 260-97.500.

Schaub, Fritz: *See—*
Schelling, Hans-Peter; and Schaub, Fritz, 3,925,429.

Scheinecker, Alois: *See—*
Stulik, Jiri; and Scheinecker, Alois, 3,924,517.

Scheinpflug, Hans: *See—*
Buchel, Karl Heinz; Frohberger, Paul-Ernst; Scheinpflug, Hans; and Enders, Edgar, 3,925,551.

Schellhammer, Carl-Wolfgang: *See—*
Dorlars, Alfons; and Schellhammer, Carl-Wolfgang, 3,925,390.

Schelling, Hans-Peter; and Schaub, Fritz, to Sandoz Ltd. Unsaturated ether and thioether amides. 3,925,429, Cl. 260-404.000.

Scheminske, Dennis L.; and Rayburn, Russell L. Portable sync-sound camera with built-in sound-monitoring system. 3,924,939, Cl. 352-34.000.

Schepers, Herman A. J.: *See—*
Roest, Bernard C.; and Schepers, Herman A. J., 3,925,512.

Schering aktiengesellschaft: *See—*
Junghans, Klaus, 3,925,173.
Nusslein, Ludwig; and Arndt, Friedrich, 3,925,473.

Schermerhorn, Jerry D., to Owens-Illinois, Inc. Spatial discharge transfer gaseous discharge display/memory panel. 3,925,703, Cl. 315-169.0TV.

Scherrer, Hanspeter: *See—*
Boller, Arthur; and Scherrer, Hanspeter, 3,925,444.

Scherzer, Julius; and Albers, Edwin Wolf, to W. R. Grace & Co. Hydrocarbon cracking process using zeolite mixtures. 3,925,195, Cl. 208-120.000.

Schick, Hannes: *See—*
Mueller-Tamm, Heinz; Schick, Hannes; Rau, Wolfgang; and Hennenberger, Peter, 3,925,341.

Schindl, Klaus P.: *See—*
Merstallinger, Kurt; and Schindl, Klaus P., 3,924,926.

Schindler, Donald G.: *See—*
Clark, John O.; Rafferty, James B.; and Schindler, Donald G., 3,924,453.

Schlag, Johannes: *See—*
Schlichting, Karl; Horn, Peter; Schlag, Johannes; and Koernig, Wolfgang, 3,925,306.

Schlanger, Gabriel Gary: *See—*
Cardwell, Robert Edward; Carlson, David Emory; Davis, Robert Leon; McNamara, Edward Joseph; Pilc, Randolph John; Schlanger, Gabriel Gary; Tutelman, David Morris; Warwick, Peter Stephen; and Zydney, Herbert Mortimer, 3,925,601.

Schleeger, Harold F. Tennis practice device. 3,924,853, Cl. 273-29.00A.

Schlichting, Karl; Horn, Peter; Schlag, Johannes; and Koernig, Wolfgang, to BASF Aktiengesellschaft. Process for stabilizing polyamides. 3,925,306, Cl. 260-45.9NC.

Schloemann-Siemag Aktiengesellshaft: *See—*
Melcher, Robert Albert, 3,924,991.

Schlotzhauer, Allan T.: *See—*
Brown, Albert E.; Schlotzhauer, Allan T.; and Newman, Douglas A., 3,924,728.

Schlumberger Technology Corporation: *See—*
Urbanosky, Harold J., 3,924,463.

Schmermund, Alfred. Machine for packaging rod-shaped articles. 3,924,386, Cl. 53-60.000.

Schmid, Hans: *See—*
Frater, Georg; Greuter, Hans; and Schmid, Hans, 3,925,477.
Frater, Georg; Greuter, Hans; and Schmid, Hans, 3,925,479.
Greuter, Hans; Frater, Georg; and Schmid, Hans, 3,925,486.

Schmid, John J., to United States of America, Army. Diglycidyl ether of 4-methylol resorcinol. 3,925,315, Cl. 260-47.0EN.

Schmidt-Dunker, Manfred: *See—*
Ploger, Walter; Schmidt-Dunker, Manfred; and Gloxhuber, Christian, 3,925,456.

Schmidt, James J.: *See—*
Bergishagen, Finn; and Schmidt, James J., 3,924,455.

Schmidt, Jurgen; and Hesse, Jurgen, to Messer Griesheim G.m.b.H. Device for deburring work pieces. 3,924,357, Cl. 51-13.000.

Schmidt, Robert R.: *See—*
Jager, Gerhard; Wenzelburger, Hans Jurgen; and Schmidt, Robert R., 3,925,386.

Schmolka, Irving R., to BASF Wyandotte Corporation. Amphoteric surfactant gels. 3,925,241, Cl. 252-316.000.

Schmuck, Johann: *See—*
Hatz, Ernst; and Schmuck, Johann, 3,924,597.

Schneider, Bernd, to Siemens Aktiengesellschaft. Pressure operated control for resistance welding machines. 3,925,635, Cl. 219-89.000.

Schneider, Charles: *See—*
Chabardes, Pierre; Grard, Charles; and Schneider, Charles, 3,925,485.

Schneider, Harvey R.: *See—*
Bigham, Clifford B.; and Schneider, Harvey R., 3,925,676.

Schneider, Heinz-Georg: *See—*
Kleimann, Helmut; von Bonin, Wulf; Schneider, Heinz-Georg; and Gebauer, Herbert, 3,925,527.

Schneider, Walter: *See—*
Althausen, Ferdinand; Boden, Heinrich; Ersfeld, Heinz; Klier, Lothar; Raffel, Reiner; and Schneider, Walter, 3,924,989.

Schnitta, Edward: *See—*
Greenwood, Arthur R.; Heinze, Walter W.; Schnitta, Edward; and Andrejasich, Frank H., 3,925,025.

Schoch, Werner: *See—*
Elser, Wolfgang; Eilingsfeld, Heinz; and Schoch, Werner, 3,925,427.

Schoenholz, Daniel: *See—*
Petersen, Arthur, Sr.; Mackowiak, Leonard S.; and Schoenholz, Daniel, 3,925,112.

Scholl, Charles H.: *See—*
Brenner, Lawrence A.; and Scholl, Charles H., 3,924,375.

Scholz, Hans: *See—*
Banks, Peter Baldwin; and Scholz, Hans, 3,925,699.

Schottel-Werft Josef Becker KG.: *See—*
Wacker, Gerd, 3,924,556.

Schowiak, Duane C., to Ford Motor Company. Mixing manifold for air atomizing spray apparatus. 3,924,806, Cl. 239-8.000.

Schrecongost, Ray B., to Hammond Corporation. Electronic keying circuit with selectable sustain characteristics. 3,924,505, Cl. 84-1.010.

Schreiber, Richard. Apparatus for dissolving oxygen in water. 3,925,522, Cl. 261-92.000.

Schreiber, William F.: *See—*
Mason, Samuel J.; Troxel, Donald E.; and Schreiber, William F., 3,925,760.

Schrenk, Walter J., to Dow Chemical Company, The. Coextrusion apparatus. 3,924,990, Cl. 425-131.100.

Schreyer, Gerd: *See—*
Geiger, Friedhelm; Heimberger, Werner; Schreyer, Gerd; and Weigert, Wolfgang, 3,925,377.

Schubert, Klaus; and Grohmann, Klaus, to Krups, Robert. Apparatus for forming windings on rotors of electric motors or the like. 3,924,816, Cl. 242-7.05B.

Schuetz, Hans-Ulrich: *See—*
Buehler, Arthur; and Schuetz, Hans-Ulrich, 3,925,346.

Schulze, Klaus: *See—*
Klemm, Peter; and Schulze, Klaus, 3,924,596.

Schuman, Seymour, to United States of America, Energy Research and Development Administration. Method of recovering uranium hexafluoride. 3,925,536, Cl. 423-258.000.

Schumann, Wilhelm; and Strathmann, Heinrich, to Forschungsinstitut Bergof GmbH. Polyimide membrane and process for making same. 3,925,211, Cl. 210-500.00M.

Schuster, Hans: *See—*
Schafer, Karl; Schuster, Hans; and Klebert, Wolfgang, 3,925,581.

Schuster, Herbert; Huther, Edmund; Ott, Karl-Heinz; and Dinges, Karl, to Bayer Aktiengesellschaft. Moulding compositions. 3,925,513, Cl. 260-883.000.

Schutz, Gunther: *See—*
Teuber, Hans-Joachin; and Schutz, Gunther, 3,925,449.

Schwartz, Morton A.: *See—*
Ning, Robert Ye-Fong; and Schwartz, Morton A., 3,925,358.

Schwarz, Maurice Jacob: *See—*
Tscharner, Christopher Johannes; Schwarz, Maurice Jacob; and Horlacher, Paul, 3,925,260.

Schwarzinger, Ernst: *See—*
Obendorf, Werner; Lindner, Irmgard; Schwarzinger, Ernst; and Krieger, Josef, 3,925,412.

Schweizer, Gottfried, to Gertach AG. Ski binding. 3,924,866, Cl. 280-11.35N.

Schweizer, Rudolf: *See—*
Guanella, Gustav; and Schweizer, Rudolf, 3,925,612.

Schwenninger, Ronald L., to PPG Industries, Inc. Flat glass inspection system and method. 3,925,049, Cl. 65-29.000.

Schwerin, Gunther, to Robert Bosch G.m.b.H. Hydraulic control arrangement. 3,924,655, Cl. 137-596.130.

Schweriner, Harold A., to Simco Company, Inc., The. Multiple copy electrostatic hold-down apparatus. 3,925,712, Cl. 317-262.00E.

Schwing, Gregory Wayne: *See—*
Adams, John Benjamin, Jr.; and Schwing, Gregory Wayne, 3,925,380.

Scibilia, Peter A., to Polaroid Corporation. Cassette light seal for cameras. 3,924,940, Cl. 352-75.000.

Science Union et Cie, Societe Francaise de Recherche Medicale: *See—*
Vincent, Michel; Remond, Georges; and Laubie, Michel, 3,925,369.

Scientific Associates, Inc.: *See—*
Nebeker, Eugene B.; and Rodriguez, Sergio E., 3,924,805.

Scientific Process & Research, Inc.: *See—*
Klein, Imrich; and Tadmor, Zehev, 3,924,842.

SCM Corporation: *See—*
McGinniss, Vincent D., 3,925,181.

Scott, Hubert D.: *See—*
Paap, Hans J.; and Scott, Hubert D., 3,925,659.

Scott Paper Company: *See—*
Brickman, W. James; and Faessinger, Robert W., 3,925,274.

Scott, Trevor William; and Hills, Geoffrey Dean Loftus, to Commonwealth Scientific and Industrial Research Organization. Feed supplements for ruminants comprising lipid encapsulated with protein-aldehyde reaction product. 3,925,560, Cl. 426-2.000.

Scriba, Peter C., to Sartorius-Membranfilter GmbH. Semi-automatic chromatographic separation apparatus. 3,925,207, Cl. 210-138.000.

Scuderi, Vincent, to Van Blarcom Closures Inc. Child proof closure. 3,924,770, Cl. 215-220.000.

Security Devices Corporation: *See—*
Amlung, Clifford L., 3,925,774.

Sedlewicz, Paul G.: *See—*
Haitz, Roland H.; Sedlewicz, Paul G.; Stirrup, Keith A.; Hilbiber, David F.; and Teichner, Robert W., 3,925,801.

Segain, John E.: *See*—
Esser, Karl; and Segain, John E., 3,925,571.
Segal, Joshua L., to United States of America, Air Force. Base two exponential counter. 3,924,614, Cl. 328-51.000.
Seidel, William Carl: *See*—
King, Charles Morgan; Seidel, William Carl; and Tolman, Chadwick Alma, 3,925,445.
Seiler, Karl: *See*—
Rau, Karlheinz; and Seiler, Karl, 3,925,583.
Seki, Ikuo: *See*—
Ogura, Jiro; Seki, Ikuo; Sato, Kiyotaka; Takahashi, Masaaki; Ito, Akira; and Igarashi, Yuriko, 3,925,222.
Sekino, Susumu: *See*—
Uchiyama, Tomoyoshi; Sekino, Susumu; and Tani, Kenji, 3,924,450.
Sekio, Isao: *See*—
Kato, Tetsuo; and Sekio, Isao, 3,925,063.
Sekisui Kagaku Kogyo Kabushiki Kaisha: *See*—
Miyoshi, Hiroshi; Mori, Hirohumi; and Tanoue, Yoriko, 3,925,269.
Sellar, Gerald Miller: *See*—
Moscioni, Richard Joseph; and Sellar, Gerald Miller, 3,924,920.
Sellgren, Arthur O.: *See*—
Haile, Paul C.; and Sellgren, Arthur O., 3,924,360.
Sem-Sandberg, Sverre George. Ship navigation equipment. 3,924,465, Cl. 73-181.000.
Seperic: *See*—
Baetz, Jacques, 3,925,396.
Serio, Vincent J., Jr.: *See*—
Diacont, George P., Jr.; and Serio, Vincent J., Jr., 3,924,785.
Sessler, Gerhard Martin: *See*—
French, Joseph Charles; Nigam, Anant Kumar; and Sessler, Gerhard Martin, 3,925,610.
Seunevel, Thierry B., to Alpha Bebe Sante, Zone Industrielle. Feeding device with regulable flow. 3,924,620, Cl. 128-252.000.
Sevrell, Sven Gosta Uno: *See*—
Rausing, Gad Anders; Stark, Sven Olof Soren; and Sevrell, Sven Gosta Uno, 3,924,796.
Sewell, Wesley C., to United States of America, Air Force. Series tuned spin coil supply. 3,925,711, Cl. 317-123.000.
Sextro, Gunter; and Burg, Karlheinz, to Hoechst Aktiengesellschaft. Thermoplastic molding composition based on poly (oxymethylenes). 3,925,505, Cl. 260-823.000.
Seyfried, Franz: *See*—
Andres, Rudolf; Moller, Hermann; and Seyfried, Franz, 3,925,656.
Shacter, John, to United States of America, Energy Research and Development Administration. Stage design. 3,925,036, Cl. 55-158.000.
Shalit, Harold; and Kieras, Joseph A., to Atlantic Richfield Company. Production of styrene. 3,925,496, Cl. 260-669.00R.
Shander, Otto A.: *See*—
MacDonnell, Robert W.; and Shander, Otto A., 3,924,541.
Mac Donnell, Robert W.; and Shander, Otto A., 3,924,542.
Shatterproof Glass Corporation: *See*—
Carmichael, Donald C.; Chambers, Douglas L.; and Wan, Chong T., 3,925,182.
Shatzkin, Leonard: *See*—
Leatherman, Alfred F.; and Shatzkin, Leonard, 3,925,126.
Shaul, Anthony James; and Wood, Edward Russell, to Formica International Ltd. Process for preparing an insulating substrate for use in printed circuits. 3,925,138, Cl. 156-313.000.
Shave, Robert C. Cushion construction. 3,924,283, Cl. 5-338.000.
Shaw, Alan, to Halifax Tool Company Limited. Percussion drill control means. 3,924,690, Cl. 173-13.000.
Shaw, Stuart Walter Ker, to International Nickel Company, Inc., The. Nickel-chromium alloys and casting thereof. 3,925,072, Cl. 75-171.000.
Shear, William: *See*—
Doyle, Alfred Michael; and Shear, William, 3,925,294.
Shechmeister, Isaac L.; Kolar, Joseph R., Jr.; and Kammlade, William G., Jr., to Southern Illinois University Foundation. Bovine vaccines and methods of making and using same. 3,925,544, Cl. 424-89.000.
Shell Oil Company: *See*—
Kohler, Jacques R.; and Binsbergen, Frederik L., 3,925,514.
Van Klinken, Jakob; and Dautzenberg, Frits M., 3,925,197.
Wicks, Moye, III, 3,925,189.
Wilpers, Dale J., 3,925,113.
Shen, Chin-Wen: *See*—
George, William D.; and Shen, Chin-Wen, 3,924,683.
Shenoha, James L.; and Sheth, Bud, to Norwood Marking & Equipment Co., Inc. Imprinting device with indexer. 3,924,527, Cl. 101-88.000.
Sherman, Ralph R., Jr., to General Electric Company. Constant current battery charging circuit. 3,925,714, Cl. 320-39.000.
Sherritt Gordon Mines Limited: *See*—
Weir, Donald Robert; and Evans, David John Ivor, 3,925,533.
Sherwood Medical Industries Inc.: *See*—
Schachet, Eli, 3,924,624.
Shestag, Lowell N.: *See*—
Hulett, James S.; and Shestag, Lowell N., 3,925,781.
Sheth, Bud: *See*—
Shenoha, James L.; and Sheth, Bud, 3,924,527.
Shiba, Keisuke: *See*—
Sato, Akira; Shiba, Keisuke; and Hinata, Masanao, 3,925,084.
Sato, Akira; Ogawa, Akira; Shiba, Keisuke; and Hinato, Masanao, 3,925,085.
Shibahara, Yasuo; and Tominaga, Yoichi, to Sanyo Chemical Industries, Ltd. Surface sizing compositions. 3,925,328, Cl. 260-78.50T.
Shibayama, Noboru: *See*—
Oshima, Yujiro; Kataoka, Masao; Tutui, Osamu; Shibayama, Noboru; Ohtuka, Masayoshi; and Ozaki, Shigehito, 3,924,457.
Shiffler, Richard W.: *See*—
Coffman, Robert L.; and Shiffler, Richard W., 3,925,223.
Shimada, Shunsaku; and Inazumi, Tadahiro, to Nippon Steel Corporation. Process for producing pellets with cement. 3,925,069, Cl. 75-3.000.
Shimamoto, Tsugio: *See*—
Okada, Hiroaki; Fujisawa, Hiroshi; Fujita, Masahiko; Shimamoto, Tsugio; and Nomura, Hiroaki, 3,925,357.
Shimizu, Noriaki. Method of making a dial for a wrist watch. 3,924,791, Cl. 228-110.000.
Shimogori, Kazutoshi: *See*—
Takamura, Akira; Shimogori, Kazutoshi; Yamagata, Toshiaki; Sato, Masao; and Kitanata, Koziro, 3,925,064.
Shimojima, Haruhiko: *See*—
Yoshino, Masataka; Kuwazawa, Hiroyasu; Shimojima, Haruhiko; Tanaka, Osamu; Kusakawa, Hideaki; Matsuoka, Hiromasa; and Maeda, Mitsuo, 3,925,021.
Shimojima, Yukiji; Takeda, Isao, deceased; by Takeda, Emiko, legal representative; Mizuno, Masayuki; Mizuno, Yukiko; and Ohoka, Tadaaki, to Asahi Kasei Kogyo Kabushiki Kaisha. Antibiotic No. 156-B1 and process for production thereof. 3,925,546, Cl. 424-116.000.
Shin, Kju Hi, to Ethyl Corporation. Process for the production of 1,3,5-trimethy-2,4,6-tris(3,5-di-tert-alkyl-4-hydroxybenzyl)benzene. 3,925,488, Cl. 260-619.00B.
Shinetsu Chemical Company: *See*—
Sakato, aoyuki; and Nakamura, Hidetosi, 3,925,289.
Shinmoto, Jitsumi. Extrusion moulding machine. 3,924,841, Cl. 259-191.000.
Shinohara, Hiroshi: *See*—
Okuda, Itsuki; Shinohara, Hiroshi; Ogawa, Haruki; and Itoh, Hideo, 3,925,555.
Shionogi & Co., Ltd.: *See*—
Kondo, Eiji; Mitsugi, Takashi; and Muneyuki, Ryonosuke, 3,925,155.
Shoda, Mikio: *See*—
Doi, Yasushi; Shoda, Mikio; Oguri, Masatoshi; and Hashimoto, Joji, 3,925,602.
Shoe & Allied Trades Research Association, The: *See*—
Richmond, Richard Malcolm, 3,925,713.
Shoemaker, John Robert, to AMP Incorporated. Flat cable electrical connections and methods of making same. 3,924,923, Cl. 339-278.00M.
Shohet, Albert J., to Harsco Corporation. Rack and pinion hoist. 3,924,710, Cl. 187-19.000.
Shoji, Michihiro: *See*—
Mitsuhashi, Shigeru; Hirokawa, Kyoichi; Saito, Noboru; Kaneko, Minoru; Shoji, Michihiro; Kowada, Masunari; and Kazama, Yasuo, 3,924,330.
Shor, Arthur Charles; and Van Dyk, John William, to Du Pont de Nemours, E. I., and Company. Process for coating substrates with α-substituted β-propiolactone graft copolymers. 3,925,574, Cl. 427-195.000.
Showalter, Lane Crawford; Brokenshire, John Leslie; and Watts, Geoffrey Brian, to Marsland Engineering Limited. Detecting apparatus. 3,925,022, Cl. 23-254.00E.
Shum, Yick-Mow: *See*—
Wu, Ching H.; Brown, Alfred; Huang, Wann-Sheng; and Shum, Yick-Mow, 3,924,682.
Shusters, Janis: *See*—
Pormale, Milda Yanovna; Kashkina, Nadezhda Alexandrovna; Veinberg, Elfrida Indrikovna; Kalninsh, Arvid Yanovich; Shusters, Janis; Mikazhans, Valdis Danielovich; Purvinsh, Indulis Valdovich; and Skutelis, Antons Petrovich, 3,925,356.
Siddiqui, Iftikhar Hussain: *See*—
Coates, Harold; Collins, John Desmond; and Siddiqui, Iftikhar Hussain, 3,925,246.
Siden, Dennis C., to Raychem Corporation. Heat recoverable connectors. 3,925,596, Cl. 174-68.500.
Siegler, E. Horace, Jr., to Perkin-Elmer Corporation. Atomic absorption spectroscopy with background correction. 3,924,950, Cl. 356-82.000.
Siemens Aktiengesellschaft: *See*—
Eberspaecher, Otto; and Pfisterer, Herman, 3,925,678.
Glasow, Peter, 3,925,669.
Haeusler, Jochen, 3,925,649.
Kessler, Claus; and Beier, Helmut, 3,925,631.
Kessler, Hartmut; and Kraus, Hubert, 3,924,563.
Richter, Martin; and Kroger, Ingo, 3,925,694.
Schneider, Bernd, 3,925,635.
Soder, Eickhardt; and Grassme, Ulrich, 3,925,672.
Touchy, Wolfgang, 3,925,121.
Wolfram, Roland, 3,925,701.
Siewert, Robert M., to General Motors Corporation. Staged combustion engines and methods of operation. 3,924,576, Cl. 123-1.00R.
Signode Corporation: *See*—
Wuetig, Ralph T., 3,924,720.
Silva, Jose R.; and Narrace, John M., to Silva, Jose R. System and method for monitoring physiological parameters. 3,924,606, Cl. 128-2.10B.

Silva, Wilbert D.: *See—*
Lindsey, Homer M.; and Silva, Wilbert D., 3,924,700.
Silvester, Brian Carol: *See—*
Stirling, Walter Robert; Ellis, Christopher Robinson; and Silvester, Brian Carol, 3,924,712.
Silvestri, Herbert H.: *See—*
Williams, Walter A.; and Silvestri, Herbert H., 3,925,418.
Simco Company, Inc., The: *See—*
Schweriner, Harold A., 3,925,712.
Simmons, Charles J., to Package Machinery Company. Seal monitoring apparatus. 3,925,139, Cl. 156-358.000.
Simmons, Samuel P.: *See—*
Markovitch, Branko, 3,924,885.
Markovitch, Branko, 3,924,886.
Markovitch, Branko, 3,924,887.
Simmons, Verlin M. Removal of obstructing snow from within snowmobile track enclosures. 3,924,905, Cl. 305-12.000.
Simon, Klaus: *See—*
Breitling, Ulrich; and Simon, Klaus, 3,924,538.
Simon, Manfred Horst: *See—*
Hannemann, Ludwig; and Simon, Manfred Horst, 3,924,745.
Simpson, David A.: *See—*
Boardman, Harold; Breslow, David S.; Simpson, David A.; and Wagner, Richard L., 3,924,520.
Simpson, Dennis D.: *See—*
Cornell, Charles R.; Simpson, Dennis D.; and Knapp, Kenneth K., 3,924,410.
Sinfelt, John H.; and Carter, James L., to Exxon Research & Engineering Co. Reforming process. 3,925,196, Cl. 208-139.000.
Singer Company, The: *See—*
Brodie, Peter M.; and Solov, Edwin G., 3,924,824.
Friedland, Bernard; and Stiles, John C., 3,924,474.
Hauber, Charles Elwood, 3,925,607.
Stiles, John C., 3,924,475.
Wendel, Lorenz A., 3,924,552.
Witteles, Abraham A.; and Putterman, Harry, 3,925,767.
Singer, Ernst. Automatic liquid sample taking and segregating apparatus. 3,924,471, Cl. 73-421.00B.
Singer, Malcolm S., to Chevron Research Company. Herbicidal and/or fungicidal 5-polyhaloethylimino- and 5-polyhalovinylimino-2,4-imidazolidinediones. 3,925,553, Cl. 424-273.000.
Singleton, Frank Henry; and Bruce, Jack William, to Woodall-Duckham, Limited. Treatment of cement kiln flue dust. 3,925,534, Cl. 423-208.000.
SKF Industrial Trading and Development Company B.V.: *See—*
Camosso, Domenico, 3,924,957.
SKF Kugellagerfabriken GmbH: *See—*
Pfeifle, Dieter, 3,924,818.
Skolnick, Leonard: *See—*
Smith, Elliott P.; Wachsmuth, Robert H.; and Skolnick, Leonard, 3,924,941.
Skomoroski, Robert M.; and Zobbi, Robert G., to American Chemical & Refining Company, Inc. Method and composition for producing bright palladium electrodepositions. 3,925,170, Cl. 204-43.00N.
Skoultchi, Martin M.: *See—*
Davis, Irwin; Skoultchi, Martin M.; and Fries, John A., 3,925,282.
Skutelis, Antons Petrovich: *See—*
Pormale, Milda Yanovna; Kashkina, Nadezhda Alexandrovna; Veinberg, Elfrida Indrikovna; Kalninsh, Arvid Yanovich; Shusters, Janis; Mikazhans, Valdis Danielovich; Purvinsh, Indulis Valdovich; and Skutelis, Antons Petrovich, 3,925,356.
Sloan, Benjamin Johnston, Jr., to Texas Instruments, Incorporated. Process for fabricating integrated circuits utilizing ion implantation. 3,925,105, Cl. 148-1.500.
Slocum, Charles W., to Thermo-Electronics, Inc. Resistance device for use in energizing the starting winding of a split phase induction motor. 3,925,748, Cl. 338-57.000.
Smeby, Robert Rudolph: *See—*
Bumpus, Francis Merlin; Khosla, Mahesh Chandra; and Smeby, Robert Rudolph, 3,925,345.
Smeltzer, William E.: *See—*
Linquist, Wayne; Pearson, Vernon W.; Hagemeyer, Kenneth; and Smeltzer, William E., 3,924,438.
Smith, Elliott P.; Wachsmuth, Robert H.; and Skolnick, Leonard, to McGraw-Hill, Inc. Cassette and cassette holder for improved controlled-reading device. 3,924,941, Cl. 352-78.00R.
Smith, Ernest L., to Phillips Petroleum Company. Frustoconical container and blank therefor. 3,924,795, Cl. 229-4.500.
Smith, George M., Jr.: *See—*
Reinhart, Robert R.; and Smith, George M., Jr., 3,925,565.
Smith, Harry: *See—*
Buckle, Derek Richard; and Smith, Harry, 3,925,557.
Smith, John H.: *See—*
Heitlinger, Louis J.; Bahr, John P.; Smith, John H.; and Anderson, Thomas W., 3,925,762.
Smith, Kenneth R.: *See—*
Matlock, Thomas D.; and Smith, Kenneth R., 3,924,316.
Smith, Norman Douglas Patrick: *See—*
Osmond, Desmond Wilfrid John; Smith, Norman Douglas Patrick; and Waite, Frederick Andrew, 3,925,032.
Smith, Randolph O.: *See—*
Chapman, John H.; Smith, Randolph O.; and Josey, Verlon E., 3,924,813.
Smith, Richard E.; and Bresnick, Herbert L., to Xerox Corporation. Split developer housing. 3,924,944, Cl. 355-3.0DD.
Smith, Scudder. Oscillator device for generating signals of a precise frequency. 3,925,734, Cl. 331-41.000.
SmithKline Corporation: *See—*
De Marinis, Robert M.; and Hoover, John R. E., 3,925,373.
Smrt, Thomas J. Stripe-adjusting apparatus for spraying machine. 3,924,784, Cl. 222-176.000.
Smyth, Roston & Pavitt: *See—*
Gillchriest, William C., 3,925,432.
Snamprogetti S.p.A.: *See—*
Koch, Paolo; and Perrotti, Emilio, 3,925,413.
Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa S.p.A.: *See—*
Giacobazzi, Valeriano, 3,924,984.
Snyder, John Harold: *See—*
Hollingsworth, Clinton Allen; and Snyder, John Harold, 3,925,024.
Snyder, William Lee: *See—*
Hanser, Paul Edmund; and Snyder, William Lee, 3,924,656.
Societa Italiana Resine S.I.R. S.p.A.: *See—*
Ferlazzo, Natale; Buzzi, Gian Fausto; and Ghirga, Marcello, 3,925,463.
Societe Anonyme dite: L'Oreal: *See—*
Viout, Andre; and Pasero, Regine, 3,925,542.
Societe Anonyme: Poclain: *See—*
Jacquot, Jean Noel, 3,924,971.
Societe Generale de Constructions Electriques et Mecaniques "Alsthom & Cie": *See—*
Bono, Pierre; Demange, Philippe; Leclere, Claudine; and Tissier, Alexis, 3,925,099.
Societe Nationale des Petroles d'Aquitaine: *See—*
Lazarre, Flavien; Rozand, Jacques; and Roumazeilles, Simonne, 3,924,658.
Soder, Eickhardt; and Grassme, Ulrich, to Siemens Aktiengesellschaft. X-ray diagnosis apparatus with a directly heated X-ray tube. 3,925,672, Cl. 250-402.000.
Sollazzi, Pasquale Robert; and Kaufman, Michael Avrum, to Rapid-American Corporation. Luggage with pull device. 3,924,872, Cl. 280-47.370.
Sollazzi, Pasquale Robert: *See—*
Bernard, James K.; and Sollazzi, Pasquale Robert, 3,924,714.
Solomon, Elias E., to Gulf & Western Manufacturing Company (Systems). Gated filter circuit. 3,925,687, Cl. 307-233.00R.
Solov, Edwin G.: *See—*
Brodie, Peter M.; and Solov, Edwin G., 3,924,824.
Soloway, Sidney: *See—*
McElroy, Jerry T.; and Soloway, Sidney, 3,924,454.
Solvay & Cie: *See—*
Giacopelli, Umberto, 3,925,186.
Somann, Gert P. Strap connector buckle. 3,924,302, Cl. 24-74.00A.
Sommer, Richard: *See—*
Wolfrum, Gerhard; Sommer, Richard; and Klauke, Erich, 3,925,350.
Sondhi, Man Mohan, to Bell Telephone Laboratories, Incorporated. Apparatus for determining the glottal waveform. 3,925,616, Cl. 179-1.0SC.
Sonntag, Alois, to Licentia Patent-Verwaltungs-G.m.b.H. High voltage thyristor. 3,925,807, Cl. 357-55.000.
Sony Corporation: *See—*
Esashi, Hanjiro; and Yoshizaki, Shuji, 3,925,820.
Ishigaki, Yoshio; Narahara, Hisaaki; and Tsuchiya, Takao, 3,925,810.
Kihara, Nobutoshi, 3,925,816.
Kobayashi, Isamu, 3,925,803.
Kodera, Yoichi, 3,924,324.
Naruse, Yosuke; Yoshioka, Taisuke; Himuro, Masami; and Ito, Keiichi, 3,925,603.
Saito, Etsuro, 3,924,860.
Sorensen, Egon, to AMF Incorporated. Pressure vessel seal and lock. 3,924,778, Cl. 220-314.000.
Sorimachi, Kanehiro: *See—*
Sanada, Noriaki; and Sorimachi, Kanehiro, 3,925,798.
Sorrells, Frank D.: *See—*
Lee, Charles A.; and Sorrells, Frank D., 3,924,626.
Southern Illinois University Foundation: *See—*
Shechmeister, Isaac L.; Kolar, Joseph R., Jr.; and Kammlade, William G., Jr., 3,925,544.
Southwest Research Institute: *See—*
Colburn, John W., Jr.; Wood, Charles D., III; Mathis, Ronald J.; and Nye, Allan R., 3,924,897.
Spadafora, Michael A.: *See—*
Harner, Kermit I.; Hixson, William W.; Spadafora, Michael A.; and Stearns, Charles F., 3,924,960.
Sparham, Vaughan Reynell. Method of separating solids suspended in a liquid. 3,925,205, Cl. 210-73.000.
Sparrendahl, Gunnar Erik William: *See—*
Edstrom, Nils Herbert; Lindqvist, Stig Gustaf Wilhelm; and Sparrendahl, Gunnar Erik William, 3,925,620.
Spector, Richard; and Stretanski, Joseph Anthony, to American Cyanamid Company. Bis(phenyl)amidotriophosphates. 3,925,518, Cl. 260-958.000.
Speiser, Jeffrey M.; Whitehouse, Harper J.; and Alsup, James M., to United States of America, Navy. Apparatus for the generation of a high capacity chirp-Z transform. 3,925,648, Cl. 235-156.000.
Spence, John R., to Rockwell International Corporation. Direct drive circuit for light emitting diodes. 3,925,690, Cl. 307-270.000.

Sperling, Gerhard: *See—*
Hachmann, Klaus; Saran, Herbert; and Sperling, Gerhard, 3,925,234.

Sperry, Philip R.; Tyler, Derek E.; and Butzky, Leon, to Swiss Aluminium Limited. High strength aluminum base casting alloys possessing improved machinability. 3,925,067, Cl. 75-142.000.

Sperry Rand Corporation: *See—*
Kroger, Harry; and Potier, Curtis N., 3,925,078.

Spietschka, Ernst: *See—*
Papenfuss, Theodor; Rehberg, Rolf; and Spietschka, Ernst, 3,925,094.

Spivack, Mayer; and Kern, Fred R., Jr. Hand-held sail. 3,924,870, Cl. 280-11.37S.

Spreadbury, Robert J.: *See—*
Bhate, Suresh K.; Spreadbury, Robert J.; Walker, Michael S.; and Young, Frederick J., 3,925,707.

Sprengling, Gerhard R., to Westinghouse Electric Corporation. Filled composition and article containing perfluorinated surfactant. 3,925,297, Cl. 260-37.0EP.

Springer, Robert H.: *See—*
O'Brien, Darrell E.; Robins, Roland K.; and Springer, Robert H., 3,925,385.

Springett, Charles N.: *See—*
Goren, Yoram; and Springett, Charles N., 3,924,415.

Springfield Instrument Company, Inc.: *See—*
Eberhard, Heinz; and Menzer, Anton, 3,924,518.

Sprugel, Friedrich: *See—*
Froeschmann, Rasmus; and Sprugel, Friedrich, 3,925,213.

Spuhl AG: *See—*
Spuhl, Walter, 3,924,665.

Spuhl, Walter, to Spuhl AG. Spring core assembly machine. 3,924,665, Cl. 140-92.700.

Spulgis, Ivars Sigurds: *See—*
Hickey, Thomas Nelson; and Spulgis, Ivars Sigurds, 3,925,046.

Sroka, Werner: *See—*
Engel, Claus Richard; Linke, Heinz; Rothbuhr, Lothar; Sroka, Werner; Vogt, Jes; and Westlinning, Hermann, 3,925,301.

Staab, Joachim, to Hartmann & Braun Aktiengesellschaft. Two beam infrared gas analyzer. 3,925,667, Cl. 250-343.000.

Staal, Gerardus B.: *See—*
Henrick, Clive A.; and Staal, Gerardus B., 3,925,460.
Henrick, Clive A.; and Staal, Gerardus B., 3,925,461.

Stadig, William P., to Petro-Tex Chemical Corporation. Oxidative dehydrogenation process. 3,925,498, Cl. 260-680.00E.

Stahl, Herbert. Feeding arrangement for a bar-shaped object. 3,924,755, Cl. 214-1.00P.

Stahl, Herbert A., to United States of America, Army. Colloidal semiconductor and method of manufacture. 3,925,698, Cl. 313-346.000.

Stahle, Helmut: *See—*
Koppe, Herbert; Kummer, Werner; Stahle, Helmut; and Muacevic, Gojko, 3,925,446.

Stahlecker, Fritz; and Stahlecker, Hans. Apparatus for piecing a thread in an open-end spinning unit. 3,924,393, Cl. 57-34.00R.

Stahlecker, Fritz; and Stahlecker, Hans. Apparatus for piecing a thread in an open-end spinning unit. 3,924,394, Cl. 57-34.00R.

Stahlecker, Fritz; and Stahlecker, Hans. Apparatus for removing impurities from fibrous material. 3,924,397, Cl. 57-56.000.

Stahlecker, Hans: *See—*
Stahlecker, Fritz; and Stahlecker, Hans, 3,924,393.
Stahlecker, Fritz; and Stahlecker, Hans, 3,924,394.
Stahlecker, Fritz; and Stahlecker, Hans, 3,924,397.

Stallings, Robert John, Jr. Dynamic speaker having dome diaphragm and basket frequency. 3,925,626, Cl. 179-115.50R.

Stamicarbon B.V.: *See—*
Geus, John W., 3,925,481.
Schaafsma, Sijbrandus E.; and Deumens, Johannes J. M., 3,925,422.

Stamicarbon N.V.: *See—*
Roest, Bernard C.; and Schepers, Herman A. J., 3,925,512.

Standard Oil Company: *See—*
Tannenbaum, Steven R., 3,925,562.
Wardlow, Eddie, Jr., 3,925,305.

Standard-Thomson Corporation: *See—*
Duprez, Wayne R., 3,924,308.

Standex International Corporation: *See—*
Broderick, Frank William, 3,924,313.

Stanley, Robert K., to Textured Yarn Co., Inc. Strand treatment apparatus. 3,924,310, Cl. 28-1.600.

Stanley, Robert K. Strand drawing and crimping treatment. 3,924,311, Cl. 28-72.110.

Stanley Tools Ltd.: *See—*
Carter, Ronald David, 3,924,329.

Stanley Works, The: *See—*
Whitehouse, Hugh L., 3,924,693.

Stark, Sven Olof Soren: *See—*
Rausing, Gad Anders; Stark, Sven Olof Soren; and Sevrell, Sven Gosta Uno, 3,924,796.

Starrett, Rupert M., to Risdon Manufacturing Company, The. Safety closure assembly for capping a dispensing container. 3,924,782, Cl. 222-402.110.

Stauffer Chemical Company: *See—*
Jin, Jung Il; and Hwa, Jesse C. H., 3,925,506.
MacDonald, Alan A., 3,925,055.

Stearns, Charles F.: *See—*
Harner, Kermit I.; Hixson, William W.; Spadafora, Michael A.; and Stearns, Charles F., 3,924,960.

Stearns, Charles R.: *See—*
Weinman, James A.; and Stearns, Charles R., 3,924,605.

Steensma, Peter Dennis, to International Telephone and Telegraph Corporation. Tuning structures for microstrip transmission lines. 3,925,740, Cl. 333-82.00B.

Steiger, Eberhard, to VEB Kombinat Medizin-und Labortechnik Leipzig. Biological indicator and method for its production. 3,925,159, Cl. 195-73.000.

Steingroever, Erich, to Elektro-Physik, Hans Nix & Dr. Ing. E. Steingroever, KG. Apparatus for measuring the hysteresis curve of magnetic bodies using a magnetic potential coil. 3,925,724, Cl. 324-34.00R.

Stengel, Edgar: *See—*
Reinke, Friedhelm; Stengel, Edgar; and Emde, Friedhelm, 3,925,570.

Stephens, Ruth E., to Ethyl Corporation. Catalysts. 3,925,253, Cl. 252-455.00R.

Stephenson, Roger C.: *See—*
Cooper, Earl A.; and Stephenson, Roger C., 3,924,688.

Sterling Drug Inc.: *See—*
Lesher, George Y.; and Brundage, Ruth Pauline, 3,925,398.

Stern, Louis P., to Westinghouse Electric Corporation. System and method for transferring between boiler-turbine plant control modes. 3,925,645, Cl. 235-151.210.

Sternbach, Leo Henryk: *See—*
Metlesics, Werner; and Sternbach, Leo Henryk, 3,925,359.

Stevens, Timothy S.: *See—*
Hamish, Small; and Stevens, Timothy S., 3,925,019.

Stewart, Richard P., to American Farm Systems, Inc. Roof structure. 3,924,367, Cl. 52-80.000.

Stewart, Robert Lee: *See—*
Laughlin, Robert Gene; and Stewart, Robert Lee, 3,925,262.

Stichting Reactor Centrum Nederland: *See—*
Quaadvliet, Hendricus Johannes Adrianus, 3,924,380.

Stiles, John C., to Singer Company, The. Vibrating ring gyro. 3,924,475, Cl. 74-5.60A.

Stiles, John C.: *See—*
Friedland, Bernard; and Stiles, John C., 3,924,474.

Stirling, Walter Robert; Ellis, Christopher Robinson; and Silvester, Brian Carol, to Ferodo Limited. Hydraulic liquid operated and cooled friction brake. 3,924,712, Cl. 188-264.00F.

Stirrup, Keith A.: *See—*
Haitz, Roland H.; Sedlewicz, Paul G.; Stirrup, Keith A.; Hilbiber, David F.; and Teichner, Robert W., 3,925,801.

Stitt, Donald H.: *See—*
Butcher, Thomas V.; and Stitt, Donald H., 3,924,888.

Stockinger, Friedrich; and Lohse, Friedrich, to Ciba-Geigy Corporation. Triglycidyl compounds and their use. 3,925,407, Cl. 260-309.500.

Stoepel, Kurt: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,925,395.

Stone Container Corporation: *See—*
Partain, James H., 3,924,801.

Stone, Jonathan A.; and Bluemle, Albert W., to Hooker Chemicals & Plastics Corporation. Foundry aggregate binders. 3,925,296, Cl. 260-37.00N.

Stone, Louis Earl; and Romano, Roberto, to Texas Instruments, Incorporated. Method for the two-stage epitaxial growth of III–V semiconductor compounds. 3,925,117, Cl. 148-171.000.

Stone Manganese Marine Limited: *See—*
May, Eric R., 3,924,411.

Story Chemical Corporation: *See—*
Story, Paul R.; and Busch, Peter, 3,925,417.

Story, Paul R.; and Busch, Peter, to Story Chemical Corporation. Tricyclohexylidene peroxide and dicyclohexylidene peroxide and method of producing the same. 3,925,417, Cl. 260-338.000.

Story, Paul Richard; Busch, Peter; Denson, Donald Derby; and Wright, Carl Edward, to Research Corporation. Method for the preparation of macrocyclic compound. 3,925,421, Cl. 260-343.000.

Stover, David Emmert: *See—*
Wagner, Joseph Francis; Broderick, Ross Thomas; Link, Joseph Edward; and Stover, David Emmert, 3,924,904.

Stover, Harris A. Monitoring system for detecting defective rails or road beds. 3,924,461, Cl. 73-146.000.

Strain, Robert Joseph; and Thornber, Karvel Kuhn, to Bell Telephone Laboratories, Incorporated. Transfer filter for transfer devices. 3,925,806, Cl. 357-24.000.

Stratford Engineering Corporation: *See—*
Putney, David H.; and Graham, Ward A., 3,925,501.

Strathmann, Heinrich: *See—*
Schumann, Wilhelm; and Strathmann, Heinrich, 3,925,211.

Straughn, Robert O.; Elofson, Gary L.; and Reinhart, Richard D., to General Mills, Inc. Preparing an extruded puffed snack product. 3,925,563, Cl. 426-302.000.

Strauven, Kurt, to Wasser-Sand-Forschungs-U. Vertriebs G.m.b.H. Filtering device. 3,925,210, Cl. 210-335.000.

Stretanski, Joseph Anthony: *See—*
Spector, Richard; and Stretanski, Joseph Anthony, 3,925,518.

Striker, David L., to Ford Motor Company. Semi-conductor rectifier heat sink. 3,925,809, Cl. 357-81.000.

Strong, Doyle L., to Minnesota Mining and Manufacturing Company. Pressure-fixable developing powder containing a thermoplastic resin and wax. 3,925,219, Cl. 252-62.10P.

Strub, Rolf. Ski safety binding. 3,924,869, Cl. 280-11.35D.

Strunk, Manfred; Kroschel, Heinz; and Voss, Alfred, to Dynamit Nobel Aktiengesellschaft. Process for the production of explosive devices surrounded by a case. 3,924,510, Cl. 86-1.00R.

Stulik, Jiri; and Scheinecker, Alois, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Device for lifting and pivoting a metallurgical vessel. 3,924,517, Cl. 92-2.000.

Stupak, Leonid Mikhailovich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Chekotilo, Leonty Vasilievich; Martyn, Viktor Mikhailovich; Artamonov, Viktor Leonidovich; Bochorishvili, Anzor Ippolitovich; Stupak, Leonid Mikhailovich; Sysenko, Anatoly Petrovich; and Popov, Valery Georgievich, 3,924,672.

Sturwold, Robert J.; and Barrett, Fred O., to Emery Industries, Inc. Esters of polyoxyalkylene glycols and mixed dibasic acids as fiber finishes. 3,925,589, Cl. 428-395.000.

Sugawara Kogyo Co., Ltd.: *See—*
Suzuki, Nagayuki; Nakamura, Tsutomu; and Yamada, Katsuto, 3,925,584.

Sugi, Ichirow; Takenaka, Haruo; Okiyama, Toshiaki; and Kobayashi, Teruo, to Fuji Photo Film Co., Ltd. Recording method. 3,925,573, Cl. 427-145.000.

Sugimoto, Keiichi; Nishijima, Kouji; and Kakeya, Nobuharu, to Takeda Chemical Industries, Ltd. α-Alkylsulfobenzyl penicillins and production thereof. 3,925,362, Cl. 260-239.100.

Sugisawa, Masakazu, to Aisin Seiki Kabushiki Kaisha. Power steering mechanism. 3,924,705, Cl. 180-79.20R.

Sugitani, Yasuo: *See—*
Miura, Minoru; Kawasaki, Morio; Sasaki, Kantaro; Sugitani, Yasuo; and Ishimura, Susumu, 3,924,812.

Suhara, Manabu: *See—*
Oda, Yoshio; Uchida, Keiichi; Suhara, Manabu; and Morimoto, Takeshi, 3,925,464.

Sule, Frank P.: *See—*
Renner, Edmund W., Jr.; Sule, Frank P.; and Sule, Wayne P., 3,924,559.

Sule, Wayne P.: *See—*
Renner, Edmund W., Jr.; Sule, Frank P.; and Sule, Wayne P., 3,924,559.

Suler, Ladislav, to Bata Shoe Company, Inc. Control system for injection molding apparatus. 3,924,986, Cl. 425-451.200.

Sumitomo Chemical Company, Limited: *See—*
Akamatsu, Takashi; Koga, Koichi; Kondo, Mitsuru; Miyake, Makoto; and Iwasaki, Hiroshi, 3,925,416.
Ishizumi, Kikuo; Mori, Kazuo; Yamamoto, Michihiro; Koshiba, Masao; Inaba, Shigeho; and Yamamoto, Hisao, 3,925,382.
Maruyama, Isamu; Nakao, Masaru; Sasajima, Kikuo; Ono, Keiichi; Takayama, Masaharu; Katayama, Shigenari; Tanaka, Yoshihiro; Yanagihara, Izumi; Inaba, Shigeho; and Yamamoto, Hisao, 3,925,387.
Mitsushima, Hirotsugu; and Katata, Motohiro, 3,925,327.
Tottori, Nobumasa; Kato, Toshiro; Asano, Yasuhisa; Ueda, Minoru; Kirino, Osamu; Ooba, Shigehiro; Fujinami, Akira; and Ozaki, Toshiaki, 3,925,554.
Yamahara, Takeshi; and Usui, Masahiro, 3,925,436.
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,925,364.

Sumitomo Electric Industries, Ltd.: *See—*
Matsui, Kazumi; Umemori, Takashi; Matsuura, Kenji; Hosoda, Yoshikado; Nishikawa, Tadashige; and Tawara, Makoto, 3,924,537.
Osawa, Makoto; Hagiwara, Yoshitoshi; Kusaka, Kunio; Kawakita, Takao; Motoyoshi, Kenya; and Kuroishi, Nobuhito, 3,925,065.

Sumitomo Metal Industries, Ltd.: *See—*
Miura, Minoru; Kawasaki, Morio; Sasaki, Kantaro; Sugitani, Yasuo; and Ishimura, Susumu, 3,924,812.

Summerfield, Martin: *See—*
Caveny, Leonard H.; and Summerfield, Martin, 3,924,406.

Summers, Leo Ewart Arthur; and Underhill, David Sidney, to British Aircraft Corporation Limited. Forming metals. 3,924,793, Cl. 228-157.000.

Summers, Thomas Wade, to Brown & Williamson Tobacco Corporation. Ventilated filter tip cigarette. 3,924,643, Cl. 131-10.00A.

Sun Chemical Corporation: *See—*
Mattis, Donald J., 3,925,655.

Sun Oil Company of Pennsylvania: *See—*
Mills, Ivor W., 3,925,220.
Wentzheimer, William W., 3,925,500.

Sun Ventures, Inc.: *See—*
Oishi, Masayoshi, 3,925,254.

Sundbeck, Bertil: *See—*
Borretzen, Bernt; Olsson, Knut Gunnar; and Sundbeck, Bertil, 3,925,487.

Sundstrand Data Control, Inc.: *See—*
Bateman, Charles Donald; and Muller, Hans Rudolf, 3,925,751.

Sundstrand Syracuse, Inc.: *See—*
Schaller, Robert L., 3,924,359.

Suzuki, Kinya; and Izumi, Tokio, to Nippon Telegraph and Telephone Public Corporation; and Ocean Cable Co., Ltd. Armored submarine cable having lengthwise distributed insulation means in each armor wire. 3,925,598, Cl. 174-108.000.

Suzuki, Masahiko, to Casio Computer Co., Ltd. Ink jet type printing device. 3,925,787, Cl. 346-75.000.

Suzuki, Nagayuki; Nakamura, Tsutomu; and Yamada, Katsuto, to Daiichi Seiyaku Company Limited; and Sugawara Kogyo Co., Ltd. Adhesive seal and tape for sealing. 3,925,584, Cl. 428-40.000.

Suzuki, Osamu: *See—*
Azuma, Kishiro; Tsuji, Isao; Kato, Hiroyuki; Tatemichi, Hidemaro; Motegi, Akira; Suzuki, Osamu; and Kondo, Kishichiro, 3,925,322.

Suzuki, Yasoji, to Tokyo Shibaura Electric Company, Ltd. Time sharing information circuit. 3,925,685, Cl. 307-205.000.

Suzuki, Yasuhiro: *See—*
Kojima, Makoto; Noda, Yuzuru; Suzuki, Yasuhiro; and Okamoto, Toshihide, 3,925,313.

Suzuoki, Kazuhiro: *See—*
Ibata, Jyoji; Kobayashi, Hidehiko; Toyomoto, Kazuo; Suzuoki, Kazuhiro; and Nogami, Sumitaka, 3,925,272.

Swadner, Robert L.: *See—*
Gaines, Marvin E.; and Swadner, Robert L., 3,924,968.

Swallow, Ronald J., to Research Corporation. Display terminal system. 3,925,776, Cl. 340-324.0AD.

Swander, Robert W.: *See—*
Kimmel, Robert M.; Riggs, John P.; Swander, Robert W.; and Whitney, Wells, 3,925,524.

Swanson, Arthur H. Tracheotomy tube. 3,924,637, Cl. 128-351.000.

Swanson, David B.: *See—*
Horzepa, John P.; and Swanson, David B., 3,925,257.

Swanson, Ronald R., to General Mills Chemicals, Inc. Phenolic oximes. 3,925,472, Cl. 260-566.00A.

Swanson, Russell K. Unloading assembly for shopping cart. 3,924,709, Cl. 186-1.0AC.

Swanson, Sydney Alan Vasey: *See—*
Freeman, Michael Alexander Reykers; and Swanson, Sydney Alan Vasey, 3,924,277.

Swift Chemical Company: *See—*
Kealy, Joseph P., 3,925,053.

Swiss Aluminium Limited: *See—*
Sperry, Philip R.; Tyler, Derek E.; and Butzky, Leon, 3,925,067.

Swodenk, Wolfgang; and Scharfe, Gerhard, to Bayer Aktiengesellschaft. Process for the production of allyl acetate. 3,925,452, Cl. 260-497.00A.

SWS Silicones Corporation: *See—*
Lewis, Richard Newton, 3,925,285.

Sybron Corporation: *See—*
Lentine, Frank Nickolis; and Keller, William Francis, 3,924,334.
Rabinowitz, Azriel J.; and Wilson, David B., 3,924,894.
Woodhams, Glen Arthur, 3,924,660.

Sylvester, Robert T.: *See—*
Allen, Travis A.; and Sylvester, Robert T., 3,924,794.

Symborski, Alex P., to Owens-Corning Fiberglas Corporation. Apparatus for packaging linear material. 3,924,817, Cl. 242-18.00G.

Synthelabo: *See—*
Najer, Henry; and Pascal, Yves Robert Alain, 3,925,392.

Sysenko, Anatoly Petrovich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Chekotilo, Leonty Vasilievich; Martyn, Viktor Mikhailovich; Artamonov, Viktor Leonidovich; Bochorishvili, Anzor Ippolitovich; Stupak, Leonid Mikhailovich; Sysenko, Anatoly Petrovich; and Popov, Valery Georgievich, 3,924,672.

Systems, Science and Software: *See—*
Farrell, Sherman R.; and Loda, Gary K., 3,925,670.

Szepesvary, Jeno. Radial shaft packing ring. 3,924,861, Cl. 277-185.000.

Szymaszek, Paul G., to Vilter Manufacturing Corporation. Control means for a variable capacity rotary screw compressor. 3,924,972, Cl. 417-310.000.

Szypka, Zdzislaw: *See—*
Bojarska-Dahlig, Halina; and Szypka, Zdzislaw, 3,925,352.

Tadmor, Zehev: *See—*
Klein, Imrich; and Tadmor, Zehev, 3,924,842.

Tahara, Kumeo, to Alps Motorola, Inc. Head shifting mechanism for two-channel and four-channel cartridge tape recorder. 3,925,818, Cl. 360-106.000.

Taillardat, Jacques, to La Technique Integrale. Screw and nut transmission mechanism. 3,924,486, Cl. 74-459.000.

Taira, Kaoru; and Inoue, Hirotoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Main combustion chamber of swirl chamber type diesel engine. 3,924,580, Cl. 123-30.00C.

Tajima, Yawara: *See—*
Sakai, Kiyoshi; Inoue, Kenji; Tajima, Yawara; Yamazaki, Mitsuo; Ohuchi, Kazuo; and Yusa, Takashi, 3,925,451.

Takahashi, Masaaki: *See—*
Ogura, Jiro; Seki, Ikuo; Sato, Kiyotaka; Takahashi, Masaaki; Ito, Akira; and Igarashi, Yuriko, 3,925,222.

Takahashi, Noboru; Nakamura, Mutsuaki; Ozaki, Sadao; Isono, Hiromasa; and Fukushima, Iwao, to Victor Company of Japan, Limited. Process for preparation of magnetic alloy powder. 3,925,114, Cl. 148-105.000.

Takahashi, Yasuo; and Ogawa, Ryota, to Asahi Kogaku Kogyo Kabushiki Kaisha. Large aperture wide angle lens. 3,924,935, Cl. 350-214.000.

Takaki, Shoji: *See—*
Ukaji, Rokuo; Kamihigoshi, Tutomu; Mikami, Kenji; and Takaki, Shoji, 3,925,263.
Ukaji, Rokuo; Kamihigoshi, Tutomu; Mikami, Kenji; and Takaki, Shoji, 3,925,492.

Takamura, Akio; and Harada, Tsutomu, to Kabushiki Kaisha Ono Sokki Seiksakusho. Flowmeter. 3,924,467, Cl. 73-213.000.

Takamura, Akio: *See—*
Konomi, Toshiaki; and Takamura, Akio, 3,924,445.

Takamura, Akira; Shimogori, Kazutoshi; Yamagata, Toshiaki; Sato, Masao; and Kitanata, Koziro, to Kobe Steel Ltd. High corrosion fatigue strength stainless steel. 3,925,064, Cl. 75-128.00A.
Takasu, Isamu, to Toyo Glass Machinery Company, Ltd. Speed reduction mechanism. 3,924,478, Cl. 74-63.000.
Takayama, Masaharu: *See—*
Maruyama, Isamu; Nakao, Masaru; Sasajima, Kikuo; Ono, Keiichi; Takayama, Masaharu; Katayama, Shigenari; Tanaka, Yoshihiro; Yanagihara, Izumi; Inaba, Shigeho; and Yamamoto, Hisao, 3,925,387.
Takechi, Hiroshi; Kawano, Tsuyoshi; Hashizume, Toshio; Koyama, Kazuo; and Masui, Hiroaki, to Nippon Steel Corporation. High tensile strength and steel and method for manufacturing same. 3,925,111, Cl. 148-12.00F.
Takeda Chemical Industries, Ltd.: *See—*
Nara, Kiyoshi; Katamoto, Kazuyoshi; Ohta, Kazuhiko; and Fukuda, Hideo, 3,925,465.
Okada, Hiroaki; Fujisawa, Hiroshi; Fujita, Masahiko; Shimamoto, Tsugio; and Nomura, Hiroaki, 3,925,357.
Sugimoto, Keiichi; Nishijima, Kouji; and Kakeya, Nobuharu, 3,925,362.
Takeda, Emiko, legal representative: *See—*
Ishida, Torao; Ohoishi, Junichi; Yoshida, Kouichi; Akashi, Kageyasu; Takeda, Isao, deceased; and Takeda, Emiko, legal representative, 3,925,415.
Shimojima, Yukiji; Takeda, Isao, deceased; Takeda, Emiko, legal representative; Mizuno, Masayuki; Mizuno, Yukiko; and Ohoka, Tadaaki, 3,925,546.
Takeda, Isao, deceased: *See—*
Ishida, Torao; Ohoishi, Junichi; Yoshida, Kouichi; Akashi, Kageyasu; Takeda, Isao, deceased; and Takeda, Emiko, legal representative, 3,925,415.
Shimojima, Yukiji; Takeda, Isao, deceased; Takeda, Emiko, legal representative; Mizuno, Masayuki; Mizuno, Yukiko; and Ohoka, Tadaaki, 3,925,546.
Takemura, Takehide: *See—*
Minami, Shunji; Oka, Shunzo; and Takemura, Takehide, 3,925,720.
Takenaka, Haruo: *See—*
Sugi, Ichirow; Takenaka, Haruo; Okiyama, Toshiaki; and Kobayashi, Teruo, 3,925,573.
Takenouchi, Kuniyoshi; Ohno, Norihiro; and Kondo, Fusao, to Lion Fat & Oil Co., Ltd. Process for improving granulated detergents. 3,925,226, Cl. 252-92.000.
Takeuchi, Shoichi: *See—*
Matsumura, Yasuo; and Takeuchi, Shoichi, 3,925,291.
Takman, Bertil H.: *See—*
Adams, Herbert H. F.; Anderson, Jon C.; Blair, Murray R., Jr.; DiRubio, Robert L.; and Takman, Bertil H., 3,925,469.
Talis, Nikolai Semenovich; and Jursakov, Anatoly Illarionovich. Rotary tablet-making machine. 3,924,996, Cl. 425-348.00R.
Taminini, Robert J. Wind driven power generator. 3,924,966, Cl. 416-177.000.
Tammone, John M. Blackjack teaching device. 3,924,340, Cl. 35-8.00B.
Tamol, Ronald A. Educational game device. 3,924,852, Cl. 273-1.00M.
Tamura Electric Works, Ltd.: *See—*
Ohtsuka, Shuji; and Sato, Toshio, 3,925,741.
Tamura, Masao: *See—*
Saida, Hiroji; Ono, Yuichi; Nomura, Masayoshi; Tamura, Masao; and Kozuka, Hirotsugu, 3,925,120.
Tanabe Seiyaku Co. Ltd.: *See—*
Chibata, Ichiro; Yamada, Shigeki; and Yamamoto, Masao, 3,925,454.
Tanaka, Hideki; Watanabe, Mikio; Handa, Minoru; Inouchi, Mitsuhiro; Yoshioka, Shigeru; and Ishida, Kazutaka, to Furuno Electric Company, Ltd. Signal detecting device. 3,925,732, Cl. 325-325.000.
Tanaka, Hiroshi: *See—*
Izumi, Sumio; and Tanaka, Hiroshi, 3,925,200.
Tanaka, Osamu: *See—*
Yoshino, Masataka; Kuwazawa, Hiroyasu; Shimojima, Haruhiko; Tanaka, Osamu; Kusakawa, Hideaki; Matsuoka, Hiromasa; and Maeda, Mitsuo, 3,925,021.
Tanaka, Yoshihiro: *See—*
Maruyama, Isamu; Nakao, Masaru; Sasajima, Kikuo; Ono, Keiichi; Takayama, Masaharu; Katayama, Shigenari; Tanaka, Yoshihiro; Yanagihara, Izumi; Inaba, Shigeho; and Yamamoto, Hisao, 3,925,387.
Tangorra, Giorgio; Bertelli, Italo; and Calori, Giovanni, to Industrie Pirelli S.p.A. Pneumatic tire for vehicle wheels. 3,924,670, Cl. 152-375.000.
Tani, Kenji: *See—*
Uchiyama, Tomoyoshi; Sekino, Susumu; and Tani, Kenji, 3,924,450.
Tannahill, Clifton A.: *See—*
Maly, George P.; and Tannahill, Clifton A., 3,924,414.
Tannenbaum, Stanley, to Thiokol Corporation. Heterogeneous monopropellant compositions. 3,925,124, Cl. 149-74.000.
Tannenbaum, Steven R., to Standard Oil Company. Texturizing process for single cell protein containing protein mixtures. 3,925,562, Cl. 426-276.000.
Tanoue, Yoriko: *See—*
Miyoshi, Hiroshi; Mori, Hirohumi; and Tanoue, Yoriko, 3,925,269.
Tashiro, Hiroyuki: *See—*
Ota, Nobuyoshi; and Tashiro, Hiroyuki, 3,925,754.
Tate, Jack F., to Texaco Inc. Method for stimulating well production. 3,924,684, Cl. 166-307.000.
Tate, Jack F., to Texaco Inc. Method for oil recovery. 3,924,685, Cl. 166-308.000.
Tate, Jack F.: *See—*
Sample, Thomas E., Jr.; Hughes, James W.; and Tate, Jack F., 3,925,582.
Tate, Raymond F. Picture framing clip. 3,924,307, Cl. 24-243.00P.
Tatemichi, Hidemaro: *See—*
Azuma, Kishiro; Tsuji, Isao; Kato, Hiroyuki; Tatemichi, Hidemaro; Motegi, Akira; Suzuki, Osamu; and Kondo, Kishichiro, 3,925,322.
Tatsumi, Youji; Ito, Shohei; and Ishii, Katsutoshi. Internal grinder. 3,924,355, Cl. 51-3.000.
Taub, David: *See—*
Wendler, Norman L.; and Taub, David, 3,925,419.
Tawara, Makoto: *See—*
Matsui, Kazumi; Umemori, Takashi; Matsuura, Kenji; Hosoda, Yoshikado; Nishikawa, Tadashige; and Tawara, Makoto, 3,924,537.
Taylor, Christine; and Chisnall, David William, to Hilary Page "Sensible" Toys Limited. Musical toy with rearrangeable parts. 3,924,348, Cl. 46-17.000.
Taylor Diving & Salvage Co., Inc.: *See—*
Banjavich, Mark P.; and Gaudiano, Anthony V., 3,924,616.
Banjavich, Mark P.; and Gaudiano, Anthony V., 3,924,618.
Banjavich, Mark P.; and Gaudiano, Anthony V., 3,924,619.
Taylor, Glenn M.; Patel, Harish A.; and McWhorter, Daniel M., to Kendall Company, The. Safety catheter and method. 3,924,634, Cl. 128-349.00B.
Taylor, James L. Height gage. 3,924,337, Cl. 33-169.00R.
Taylor, John J. Camera apparatus for making photographic images on moving cut film pieces. 3,925,796, Cl. 354-180.000.
Tchelitcheff, Serge, to Rhone-Poulenc S.A. 1-(5-Nitrothi-alzol-2-yl)-imidazolidine-2-thione having anti-parasitic and anti-microbial properties. 3,925,550, Cl. 424-270.000.
Tchernev, Dimiter I. Device for solar energy conversion by photoelectrolytic decomposition of water. 3,925,212, Cl. 250-527.000.
Technicon Instruments Corporation: *See—*
Saunders, Alexander M., 3,925,018.
Technion Research and Development Foundation, Ltd.: *See—*
Manor, Gedalyahu, 3,924,689.
Teichmann, Gunter: *See—*
Bockmann, August; Teichmann, Gunter; and Rudolph, Hans, 3,925,095.
Teichner, Robert W.: *See—*
Haitz, Roland H.; Sedlewicz, Paul G.; Stirrup, Keith A.; Hilbiber, David F.; and Teichner, Robert W., 3,925,801.
Teldix GmbH: *See—*
Rodi, Anton, 3,925,719.
Teledyne, Inc.: *See—*
Conrad, Richard A., 3,924,915.
Telefonaktiebolaget L M Ericsson: *See—*
Edstrom, Nils Herbert; Lindqvist, Stig Gustaf Wilhelm; and Sparrendahl, Gunnar Erik William, 3,925,620.
Tenneco Chemicals, Inc.: *See—*
Minieri, Pasquale P., 3,925,304.
Terao, Noboru: *See—*
Watanabe, Jinzo; Terao, Noboru; Kamahara, Koichi; Miyashita, Kazuhisa; and Fujihira, Kenji, 3,925,802.
Terrell, Christopher E., to Twinlock Limited. Mold apparatus with movable web forming blade. 3,924,993, Cl. 425-242.00R.
Terry, Carol Ann: *See—*
Chang, Lung Ting; and Terry, Carol Ann, 3,925,156.
Terry, Ruel C., to In Situ Technology, Inc. Method of pyrolysis of coal in situ. 3,924,680, Cl. 166-258.000.
Terzian, Rouben T., to Marvin Glass & Associates. Kissing doll having air actuated sounder which sounds after building predetermined pressure. 3,924,351, Cl. 46-118.000.
Tetra Pak Developpement SA: *See—*
Rausing, Gad Anders; Stark, Sven Olof Soren; and Sevrell, Sven Gosta Uno, 3,924,796.
Teuber, Hans-Joachin; and Schutz, Gunther. Dimeric chloroacetonitrile and method for making the same. 3,925,449, Cl. 260-465.50R.
Texaco Inc.: *See—*
Davis, Charles W., 3,924,598.
Duranleau, Roger G.; and Larkin, John M., 3,925,430.
Duranleau, Roger G.; and Matteo, John F., 3,925,431.
Paap, Hans J.; and Scott, Hubert D., 3,925,659.
Sample, Thomas E., Jr.; Hughes, James W.; and Tate, Jack F., 3,925,582.
Tate, Jack F., 3,924,684.
Tate, Jack F., 3,924,685.
Wu, Ching H.; Brown, Alfred; Huang, Wann-Sheng; and Shum, Yick-Mow, 3,924,682.
Texas Instruments, Incorporated: *See—*
Sloan, Benjamin Johnston, Jr., 3,925,105.
Stone, Louis Earl; and Romano, Roberto, 3,925,117.
Textron, Inc.: *See—*
DeCaro, Charles J., 3,924,508.
Textured Yarn Co., Inc.: *See—*
Stanley, Robert K., 3,924,310.
Th. Kieserling & Albrecht: *See—*
Hartkopf, Heinz, 3,924,431.

Thal, Claude: *See—*
Gastambide, Bernard; Thal, Claude; Rohrbach, Phillippe; and Laroche, Marie-Jeanne, 3,925,480.
Thaler, Arnold; and Platt, Dan, to Topp Electronics, Inc. Hinge. 3,924,294, Cl. 16-174.000.
Theidel, Hans: *See—*
Boehmke, Gunther; and Theidel, Hans, 3,925,367.
Boehmke, Gunther; and Theidel, Hans, 3,925,405.
Thermo-Electronics, Inc.: *See—*
Slocum, Charles W., 3,925,748.
Thiokol Corporation: *See—*
Tannenbaum, Stanley, 3,925,124.
Thoden, John; and Wagner, Theodore, to Kontes Glass Company. Densitometer for use in quantitative thin layer chromatographic analysis. 3,924,948, Cl. 356-71.000.
Thoma, Herwig. Apparatus for the recognition of the initiaton of heart beat, from an electrocardiogram under extreme conditions. 3,924,610, Cl. 128-2.06R.
Thoma, Peter: *See—*
Heinrich, Bernhard; Naarmann, Herbert; and Thoma, Peter, 3,925,329.
Thomas, Ralph D., to United States of America, General Counsel-Code GP. Thermocouple tape. 3,925,104, Cl. 136-225.000.
Thomas, Wil B.; and Boggs, Fred, to Riverby Farms, Inc. Animal feeding device. 3,924,573, Cl. 119-61.000.
Thomson-CSF: *See—*
Coussot, Gerard; and Dieulesaint, Eugene, 3,924,312.
Thornber, Karvel Kuhn: *See—*
Strain, Robert Joseph; and Thornber, Karvel Kuhn, 3,925,806.
Tice, William A. Needle positioning apparatus for stitching machines. 3,924,553, Cl. 112-219.00B.
Timken Company, The: *See—*
Bloom, Ray A.; and Phillips, Herbert L., 3,925,060.
Tissier, Alexis: *See—*
Bono, Pierre; Demange, Philippe; Leclere, Claudine; and Tissier, Alexis, 3,925,099.
Titan Verpackungssysteme GmbH: *See—*
Buhne, Gerd, 3,924,526.
Toagosei Chemical Industry Co., Ltd.: *See—*
Azuma, Kishiro; Tsuji, Isao; Kato, Hiroyuki; Tatemichi, Hidemaro; Motegi, Akira; Suzuki, Osamu; and Kondo, Kishichiro, 3,925,322.
Tohar, David: *See—*
Prenner, Amnon; Bear, Jacob; Tohar, David; and Koplin, Harry, 3,924,677.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Kokado, Naoyuki, 3,925,613.
Ozeki, Takeshi; and Ito, Takao, 3,925,735.
Suzuki, Yasoji, 3,925,685.
Tolman, Chadwick Alma: *See—*
King, Charles Morgan; Seidel, William Carl; and Tolman, Chadwick Alma, 3,925,445.
Tomburo, Anthony F.: *See—*
Kachur, Nicholas W.; and Tomburo, Anthony F., 3,924,741.
Tominaga, Yoichi: *See—*
Shibahara, Yasuo; and Tominaga, Yoichi, 3,925,328.
Tonka Corporation: *See—*
Wamsley, Vernon R.; and Cuhel, Gerald A., 3,924,349.
Topp Electronics, Inc.: *See—*
Thaler, Arnold; and Platt, Dan, 3,924,294.
Totman, Mirrel L., to Brown, Edward L., a part interest. Method of flanged joint sealing. 3,924,649, Cl. 137-15.000.
Tottori, Nobumasa; Kato, Toshiro; Asano, Yasuhisa; Ueda, Minoru; Kirino, Osamu; Ooba, Shigehiro; Fujinami, Akira; and Ozaki, Toshiaki, to Sumitomo Chemical Company, Limited. Certain 3,5-dichlorophenyl compound used as a plant fungicide. 3,925,554, Cl. 424-274.000.
Touchy, Wolfgang, to Siemens Aktiengesellschaft. Production of semiconductive monocrystals of group III-V semiconductor compounds. 3,925,121, Cl. 148-189.000.
Toyama, Seiji; Yoshikawa, Kazuo; and Higuchi, Takeshi, to Fuji Photo Optical Co., Ltd. Optical system for color television camera. 3,925,813, Cl. 358-55.000.
Toyo Glass Machinery Company, Ltd.: *See—*
Takasu, Isamu, 3,924,478.
Toyoda, Sadao; Ogoshi, Toshiaki; Maruyama, Minoru; and Miyawaki, Yozo, to Lion Fat & Oil Co., Ltd. Isothermal sulfonation process. 3,925,441, Cl. 260-458.000.
Toyomoto, Kazuo: *See—*
Ibata, Jyoji; Kobayashi, Hidehiko; Toyomoto, Kazuo; Suzuoki, Kazuhiro; and Nogami, Sumitaka, 3,925,272.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Konomi, Toshiaki; and Takamura, Akio, 3,924,445.
Nohira, Hidetaka; and Kobashi, Kiyoshi, 3,924,589.
Taira, Kaoru; and Inoue, Hirotoshi, 3,924,580.
Yabuta, Tozo; Kaneko, Yasuhisa; and Morita, Akiyoshi, 3,925,252.
Trane Company, The: *See—*
Lievens, Ronald J.; and Kabat, Richard W., 3,924,964.
Tranter, Harold: *See—*
Lynex, Graham; and Tranter, Harold, 3,924,811.
Trecker, David John: *See—*
Rosemund, Walter Richard; Sandner, Michael Ray; and Trecker, David John, 3,925,268.
Tremblay, Paul Albert: *See—*
DerMarderosian, Dikrun; and Tremblay, Paul Albert, 3,924,495.
DerMarderosian, Dikrun; and Tremblay, Paul Albert, 3,924,496.
Trevail, Lewis Herbert; and Hegarty, Brian Anthony, to RCA Corporation. Method of making a multiplicity of multiple-device semiconductor chips and article so produced. 3,924,323, Cl. 29-583.000.
Trimble, Robert C. Attachment for reflectors for spoke wheels. 3,924,928, Cl. 350-99.000.
Triumph Werke Nurnberg A.G.: *See—*
Decker, Herbert, 3,924,726.
Trombe, Jean-Christian; and Montel, Gerard, to Etablissement Public: Agence Nationale de Valorisation de la Recherche (ANVAR). Process for treatment of ores. 3,925,062, Cl. 75-84.000.
Troup, Edward M., to Rain Bird Sprinkler, Mfg. Corporation. Construction for reducing vortex swirl in rotary water sprinklers. 3,924,809, Cl. 239-230.000.
Troxel, Donald E.: *See—*
Mason, Samuel J.; Troxel, Donald E.; and Schreiber, William F., 3,925,760.
TRW Inc.: *See—*
Barnett, Barry Roger Michael; and Burton, Arthur William, 3,924,955.
Becker, Charles Henry, 3,924,317.
Russell, Robert L., 3,925,103.
Tysseland, Harold, 3,925,623.
Tscharner, Christopher Johannes; Schwarz, Maurice Jacob; and Horlacher, Paul, to Ciba-Geigy Corporation. Crystalline forms of 4,4-bis-triazinylaminostilbene derivatives and processes for making same. 3,925,260, Cl. 252-543.000.
Tschudy, Donald B.; and Fawcett, John L., to Hoover Company, The. Blower connection and exhaust valve configuration for a cleaner or the like. 3,924,291, Cl. 15-330.000.
Tsou, Ivan H., to Grow Chemical Corporation. Method of making dry pigmented powder paint. 3,925,298, Cl. 260-39.000.
Tsuchiya, Osamu: *See—*
Umezawa, Hamao; Umezawa, Sumio; and Tsuchiya, Osamu, 3,925,353.
Umezawa, Hamao; Umezawa, Sumio; and Tsuchiya, Osamu, 3,925,354.
Tsuchiya, Takao: *See—*
Ishigaki, Yoshio; Narahara, Hisaaki; and Tsuchiya, Takao, 3,925,810.
Tsuji, Isao: *See—*
Azuma, Kishiro; Tsuji, Isao; Kato, Hiroyuki; Tatemichi, Hidemaro; Motegi, Akira; Suzuki, Osamu; and Kondo, Kishichiro, 3,925,322.
Tsunemitsu, Katsuhiko; Kiuchi, Kanji; Nakai, Yasushi; Kawai, Hajime; and Yamada, Shimpei, to Yamada Kagaku Kenkyusho Co., Ltd. Substituted o-[4-(n-alkyl-n-phenylamino)-2-hydroxybenzoyl]-benzoic acid. 3,925,457, Cl. 260-517.000.
Tsurumi, Sukeo. Cuboidal structure. 3,924,376, Cl. 52-593.000.
Tu, Peter K. C.; Brooke, Alan H.; and Miller, Frank S., to Rockwell International Corporation. Air filter. 3,925,044, Cl. 55-337.000.
Turk, Chester Frank: *See—*
Krapcho, John; and Turk, Chester Frank, 3,925,384.
Turnbull, John William, to Du Pont de Nemours, E. I., and Company. Poly(meta-phenylene isophthalamide)powder. 3,925,323, Cl. 260-78.00S.
Turner, Abner B. System for introducing flocculating ions and air into waste water treatment systems. 3,925,203, Cl. 210-44.000.
Tutelman, David Morris: *See—*
Cardwell, Robert Edward; Carlson, David Emory; Davis, Robert Leon; McNamara, Edward Joseph; Pilc, Randolph John; Schlanger, Gabriel Gary; Tutelman, David Morris; Warwick, Peter Stephen; and Zydney, Herbert Mortimer, 3,925,601.
Tutui, Osamu: *See—*
Oshima, Yujiro; Kataoka, Masao; Tutui, Osamu; Shibayama, Noboru; Ohtuka, Masayoshi; and Ozaki, Shigehito, 3,924,457.
Twinlock Limited: *See—*
Terrell, Christopher E., 3,924,993.
Tyler, Derek E.: *See—*
Sperry, Philip R.; Tyler, Derek E.; and Butzky, Leon, 3,925,067.
Tyrode, Alain: *See—*
Meister, Rene; and Tyrode, Alain, 3,925,693.
Tysseland, Harold, to TRW Inc. Line identification and metering system. 3,925,623, Cl. 179-18.0FH.
Uchida, Keiichi: *See—*
Oda, Yoshio; Uchida, Keiichi; Suhara, Manabu; and Morimoto, Takeshi, 3,925,464.
Uchidoi, Masanori: *See—*
Yamada, Tateo; and Uchidoi, Masanori, 3,924,942.
Uchiyama, Tomoyoshi; Sekino, Susumu; and Tani, Kenji, to Hitachi Shipbuilding and Engineering Co. Ltd. Device for measuring three dimensional coordinates of models. 3,924,450, Cl. 73-67.000.
Ueda, Minoru: *See—*
Tottori, Nobumasa; Kato, Toshiro; Asano, Yasuhisa; Ueda, Minoru; Kirino, Osamu; Ooba, Shigehiro; Fujinami, Akira; and Ozaki, Toshiaki, 3,925,554.
Ukaji, Rokuo; Kamihigoshi, Tutomu; Mikami, Kenji; and Takaki, Shoji, to Daikin Kogyo Co., Ltd. Process for preparing polycarbonmonofluoride. 3,925,263, Cl. 260-2.00H.
Ukaji, Rokuo; Kamihigoshi, Tutomu; Mikami, Kenji; and Takaki, Shoji, to Daikin Kogyo Co., Ltd. Process for preparing polycarbonmonofluoride. 3,925,492, Cl. 260-653.900.
Ultrasonic Systems, Inc.: *See—*
Balamuth, Lewis; Kuris, Arthur; and Karatjas, Manuel, 3,924,335.
UMC Industries, Inc.: *See—*
Pescetto, James R., 3,924,847.

Umemori, Takashi: *See—*
Matsui, Kazumi; Umemori, Takashi; Matsuura, Kenji; Hosoda, Yoshikado; Nishikawa, Tadashige; and Tawara, Makoto, 3,924,537.
Umezawa, Hamao; Umezawa, Sumio; and Tsuchiya, Osamu, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. 4-0-(6-Alkylamino-6-deoxy-alpha-D-hexopyranosyl)-deoxystreptamine derivatives and the production thereof. 3,925,353, Cl. 260-210.0AB.
Umezawa, Hamao; Umezawa, Sumio; and Tsuchiya, Osamu, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Process for the production of an 1-n-(s)-alpha- substituted-w-aminoacyl) derivative of neamine, 3′, 4′-dideoxyneamine, ribostamycin or 3′,4′-dideoxyribostamycin. 3,925,354, Cl. 260-210.0AB.
Umezawa, Sumio: *See—*
Umezawa, Hamao; Umezawa, Sumio; and Tsuchiya, Osamu, 3,925,353.
Umezawa, Hamao; Umezawa, Sumio; and Tsuchiya, Osamu, 3,925,354.
Underhill, David Sidney: *See—*
Summers, Leo Ewart Arthur; and Underhill, David Sidney, 3,924,793.
Unex Conveying Systems, Inc.: *See—*
Gotham, Robert W.; and McKnight, Robert J., 3,924,908.
Union Carbide Corporation: *See—*
Chuang, Vincent T., 3,925,434.
Coffman, Robert L.; and Shiffler, Richard W., 3,925,223.
Koleske, Joseph Victor; Whitworth, Clyde Jesse, Jr.; and Lundberg, Robert Dean, 3,925,504.
Kozawa, Akiya, 3,925,102.
Kun, Leslie C., 3,924,441.
Patterson, Michael Frederick; and Kather, Kenneth Calvin, 3,925,041.
Rosemund, Walter Richard; Sandner, Michael Ray; and Trecker, David John, 3,925,268.
Walsh, John J.; and Chuang, Vincent T., 3,925,093.
Union Oil Company of California: *See—*
Maly, George P.; and Tannahill, Clifton A., 3,924,414.
Uniroyal, Inc.: *See—*
Hiatt, Norman A.; Wolf, Harold G.; and Hlavacek, Robert A., 3,925,319.
Hunter, Byron A., 3,925,270.
Hunter, Byron A., 3,925,466.
Jancis, Elmar Harry, 3,925,308.
Loveless, Frederick C., 3,925,511.
Unisearch Limited: *See—*
Hiller, John Barry; Richards, John Alan; and Huey, Richard Meredyth, 3,925,663.
United States Gypsum Company: *See—*
Lizdas, Thomas E.; and Peterson, Bulow A., 3,924,373.
United States of America
Agriculture: *See—*
Randall, John M.; Hautala, Earl; Waiss, Anthony C., Jr.; and Kuhnle, Judith A., 3,925,192.
Air Force: *See—*
Arnold, Fred E.; Breland, John G.; and Villaescusa, Frank W., 3,925,311.
Caveny, Leonard H.; and Summerfield, Martin, 3,924,406.
Reinert, Milton J., 3,924,826.
Segal, Joshua L., 3,924,614.
Sewell, Wesley C., 3,925,711.
Army: *See—*
Anderl, Josef H.; and Oliva, George R., Jr., 3,925,782.
Bates, Calvin D.; and Hartley, Joseph H., 3,925,738.
Bleday, Michael P.; and Youngren, Fred R., 3,925,783.
Fagg, Charles R., 3,924,512.
Gruner, Frederick R., 3,924,534.
Gulbis, Imants; and Jordan, Rodney W., 3,925,675.
Lohrmann, Dieter R., 3,925,736.
Schmid, John J., 3,925,315.
Stahl, Herbert A., 3,925,698.
Van Landuyt, Dennis C.; and Ayers, Orval E., 3,925,410.
Energy Research and Development Administration: *See—*
Allen, Travis A.; and Sylvester, Robert T., 3,924,794.
D'Silva, Arthur P.; and Fassel, Velmer A., 3,925,674.
Esebaggers, Jan, 3,924,675.
Nilsen, Roy J., 3,925,109.
Schuman, Seymour, 3,925,536.
Shacter, John, 3,925,036.
Ziegler, Donald L., 3,925,039.
General Counsel-Code GP: *See—*
Heyman, Joseph S.; and Miller, James G., 3,924,444.
Thomas, Ralph D., 3,925,104.
Health, Education and Welfare: *See—*
Blume, Philip, 3,925,166.
Henkin, Robert I.; and Giroux, Eugene L., 3,925,547.
Interior: *See—*
Guidotti, Ronald A., 3,925,068.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Webster, James A. Polyimides of ether-linked aryl tetracarboxylic dianhydrides. 3,925,312, Cl. 260-47.0CP.
Navy: *See—*
Allard, Frederick C., 3,924,953.
Bultman, John D.; Jurd, Leonard; and Ritchie, Donald D., 3,925,558.
Cox, Charles D.; Johnson, Craig E.; and Henderson, Larry D., 3,925,125.
Dick, John O.; and Forrester, Howard M, 3,924,536.
Ebert, Robert H., 3,925,710.
Few, Arthur A., 3,925,726.
Howard, Robert G.; and Zivi, Edwin L., Jr., 3,924,448.
Leonard, Joseph T., 3,925,088.
Moore, Wayne E., 3,925,733.
Roos, Dewey A.; Lawlor, Kenneth A.; and Abadie, Erwin I., 3,924,535.
Speiser, Jeffrey M.; Whitehouse, Harper J.; and Alsup, James M., 3,925,648.
Woodworth, William H.; and Cunningham, Robert D., 3,924,458.
U.S. Philips Corporation: *See—*
Althuber, Horst; and Rupp, Karl, 3,925,817.
Blom, Hendrik; and Mollet, Prudent Eduardus Jacobus, 3,925,812.
Bousmar, Michel Antony Marie Joseph, 3,925,614.
Hollan, Laszlo, 3,925,118.
Houben, Mathijs Maria Hendrikus, 3,925,089.
Mollet, Prudent Eduardus Jacobus, 3,925,608.
Postma, Lambertus, 3,925,080.
Vrijssen, Gerardus Arnoldus Herman Maria, 3,924,792.
Wanmaker, Willem Lambertus; and Radielovic, Dragutin, 3,925,239.
United States Steel Corporation: *See—*
Clark, John O.; Rafferty, James B.; and Schindler, Donald G., 3,924,453.
United Technologies Corporation: *See—*
Amoroso, Salvatore, 3,925,729.
Cheo, Peter K., 3,924,931.
Harner, Kermit I.; Hixson, William W.; Spadafora, Michael A.; and Stearns, Charles F., 3,924,960.
Roantree, James P.; and Saunders, John, 3,925,642.
Roantree, James P.; Saunders, John; and Baum, Robert A., 3,925,643.
Roantree, James P.; and Saunders, John, 3,925,654.
Universal Oil Products Company: *See—*
Boney, William G.; and Kuchar, Paul J., 3,925,502.
Greenwood, Arthur R.; Heinze, Walter W.; Schnitta, Edward; and Andrejasich, Frank H., 3,925,025.
Lester, George R., 3,925,188.
Rolf, David A.; and Chance, Vernon B., Jr., 3,925,256.
University of Missouri, The Curators of the: *See—*
Lee, Vin-Jang, 3,925,235.
University of Utah: *See—*
Eckhoff, David W.; and Fullmer, Blaine L., 3,925,198.
Unruh, James Bradley: *See—*
Cooper, Donald Walter; and Unruh, James Bradley, 3,924,723.
Uozumi, Iwao, to Iwatani & Co., Ltd. Pin locking device. 3,924,506, Cl. 85-8.100.
Updike, Stuart J., to Wisconsin Alumni Research Foundation. Preparation of dry, porous gel particles having high water regain for liquid sampling. 3,925,017, Cl. 23-230.00B.
Upjohn Company, The: *See—*
Axen, Udo F., 3,925,450.
Axen, Udo F., 3,925,459.
Carleton, Peter S.; Lockwood, Robert J.; and Reymore, Harold E., Jr., 3,925,284.
Hippel, Ludwig Jakob; and Pemsl, Alex, 3,924,651.
Knis, Stephen A.; and Sayigh, Adnan A. R., 3,924,837.
Urbanosky, Harold J., to Schlumberger Technology Corporation. Apparatus for testing earth formations composed of particles of various sizes. 3,924,463, Cl. 73-155.000.
Usui, Masahiro: *See—*
Yamahara, Takeshi; and Usui, Masahiro, 3,925,436.
Utman, Leslie H.; and Fiorini, Dante M. Protective housing means for trailer coupler hitched to vehicle or device. 3,924,878, Cl. 280-507.000.
Vahaviolos, Sotirios John, to Western Electric Company, Inc. Methods and apparatus for detecting the presence of cracks in a workpiece by the use of stress waves emitted therefrom. 3,924,456, Cl. 73-88.00R.
Vaiano, Vincent; 116-30-127th St. Portable play pen. 3,924,280, Cl. 5-98.00R.
Vaillant, Christian; and Menissez, Jean Pierre, to Fives-Cail Babcock. Apparatus for installing a heavy mobile machine in a working position. 3,924,876, Cl. 280-150.500.
Valvassori, Alberto; Sartori, Guido; and Cameli, Nazzareno, to B. F. Goodrich Company, The. Olefinic polymers of methyl-tricyclo-3,8-decadiene. 3,925,333, Cl. 260-79.50B.
Van Blarcom Closures Inc.: *See—*
Scuderi, Vincent, 3,924,770.
van den Ouweland, Godefridus Antonius Maria: *See—*
Herstel, Henk; and van den Ouweland, Godefridus Antonius Maria, 3,925,561.
Vanderberg, Lawrence J.: *See—*
Woodward, Gary F.; and Vanderberg, Lawrence J., 3,925,747.
Van Dyk, John William: *See—*
Shor, Arthur Charles; and Van Dyk, John William, 3,925,574.
Van Gelder, Josephus Ludovicus Hubertus; Raeymaekers, Alfons Herman Margaretha; Roevens, Leopold Frans Corneel; and Van Laerhoven, Willey Joannes, to Janssen Pharmaceutica N.V. Bicyclic imidazoles and pyrimidines. 3,925,383, Cl. 260-256.40F.
Van Klinken, Jakob; and Dautzenberg, Frits M., to Shell Oil Company. Hydrodesulfurization process. 3,925,197, Cl. 208-216.000.

Van Laerhoven, Willey Joannes: *See—*
Van Gelder, Josephus Ludovicus Hubertus; Raeymaekers, Alfons Herman Margaretha; Roevens, Leopold Frans Corneel; and Van Laerhoven, Willey Joannes, 3,925,383.
Van Landuyt, Dennis C.; and Ayers, Orval E., to United States of America, Army. Process for making 1-pyrrolidinyl methyl ferrocene. 3,925,410, Cl. 260-326.800.
Van Nice, Robert I., to Westinghouse Electric Corporation. Interleaved winding for electrical inductive apparatus. 3,925,743, Cl. 336-70.000.
Van Pool, Joe: *See—*
Constantikes, George J.; and Van Pool, Joe, 3,925,193.
Van Tongelen, Marcel: *See—*
Draguez de Hault, Emmanuel R. E. G.; Debus, Henri R.; and Van Tongelen, Marcel, 3,925,425.
Van Voorhis, David C., to International Business Machines Corporation. Apparatus for data compression encoding and decoding. 3,925,780, Cl. 340-347.0DD.
Van Zanten, Kenneth D.: *See—*
Whitcombe, John A.; Van Zanten, Kenneth D.; and Kane, George C., 3,925,190.
Varian Associates: *See—*
Harra, David J., 3,924,967.
Vater, Wulf: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,925,395.
Vaum, Howard Thomas: *See—*
Betts, Joseph Elwood; Ott, William Michael, Jr.; and Vaum, Howard Thomas, 3,924,985.
Veale, Charles C. Faucets. 3,924,659, Cl. 137-630.170.
VEB Kombinat Medizin-und Labortechnik Leipzig: *See—*
Steiger, Eberhard, 3,925,159.
Veba-Chemie AG: *See—*
Voges, Heinz-Werner; and Ewers, Josef, 3,925,378.
Veil, Karl: *See—*
Rometsch, Werner; and Veil, Karl, 3,924,969.
Veinberg, Elfrida Indrikovna: *See—*
Pormale, Milda Yanovna; Kashkina, Nadezhda Alexandrovna; Veinberg, Elfrida Indrikovna; Kalninsh, Arvid Yanovich; Shusters, Janis; Mikazhans, Valdis Danielovich; Purvinsh, Indulis Valdovich; and Skutelis, Antons Petrovich, 3,925,356.
Velker, Eugen; Bentz, Francis; and Nischk, Gunther, to Bayer Aktiengesellschaft. 2-Methylene propane phosphonic acid esters. 3,925,515, Cl. 260-932.000.
Velsicol Chemical Corporation: *See—*
Krenzer, John, 3,925,054.
Krenzer, John, 3,925,402.
Krenzer, John, 3,925,403.
Veltges, Helmut: *See—*
Franzen, Gustav; and Veltges, Helmut, 3,924,392.
Venable, H. Dean, to Hughes Aircraft Company. Regulated DC to DC converter. 3,925,715, Cl. 321-2.000.
Venaleck, John T., to A & P Products Incorporated. Connector adapter. 3,924,916, Cl. 339-17.0LC.
Venkatesan, Peruvemba Swaminatha: *See—*
Prematta, Robert Joseph; and Venkatesan, Peruvemba Swaminatha, 3,925,110.
VerBurg, David L. Apparatus for freeze forming meat products. 3,924,295, Cl. 17-32.000.
Verdouw, Albert J., to General Motors Corporation. Air preheating combustion apparatus. 3,925,002, Cl. 431-10.000.
Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft: *See—*
Stulik, Jiri; and Scheinecker, Alois, 3,924,517.
Verney, Paul Jean: *See—*
Cheysson, Philippe Jean-Marie; Verney, Paul Jean; and Coquard, Michel Alain, 3,925,204.
Vertesi, Tibor Miklos, to Gamma Engineering Limited. Apparatus for producing continuous metal castings. 3,924,673, Cl. 164-274.000.
Vetco Offshore Industries, Inc.: *See—*
Ahlstone, Arthur G., 3,924,678.
Jansen, Martin B., Jr., 3,924,679.
Vetter, Hans: *See—*
Wingender, Kaspar; and Vetter, Hans, 3,925,075.
Victor Company of Japan, Limited: *See—*
Takahashi, Noboru; Nakamura, Mutsuaki; Ozaki, Sadao; Isono, Hiromasa; and Fukushima, Iwao, 3,925,114.
Viking Corporation, The: *See—*
Groos, Richard T., 3,924,687.
Villacampa, Eugenio G. Fuel and oil additive. 3,925,031, Cl. 44-56.000.
Villaescusa, Frank W.: *See—*
Arnold, Fred E.; Breland, John G.; and Villaescusa, Frank W., 3,925,311.
Vilter Manufacturing Corporation: *See—*
Szymaszek, Paul G., 3,924,972.
Vincent, Michel; Remond, Georges; and Laubie, Michel, to Science Union et Cie, Societe Francaise de Recherche Medicale. New tricyclic ureas processes for their production and pharmaceutical compositions. 3,925,369, Cl. 260-243.00A.
Vinje, Gunnar. Clamping tool. 3,924,440, Cl. 72-397.000.
Violet M. Hanson: *See—*
Hanson, Violet M.; and Finn, John E., 3,924,521.
Viout, Andre; and Pasero, Regine, to Societe Anonyme dite: L'Oreal. Hair lacquer and wave setting compositions containing vinyl acetate-crotonic acid-containing polymers. 3,925,542, Cl. 424-47.000.
Vitous, Charles J., to Cory Food Services, Inc. Beverage chamber filter. 3,924,525, Cl. 99-303.000.
Vivant, Gilbert: *See—*
Rio, Andre; and Vivant, Gilbert, 3,925,303.
Vives, Van C., to Phillips Petroleum Company. Aminodicyano alkene compounds. 3,925,374, Cl. 260-247.000.
Vogel, Axel, to Bayer Aktiengesellschaft. Process for the production of 1-nitroanthraquinone. 3,925,426, Cl. 260-369.000.
Voges, Heinz-Werner; and Ewers, Josef, to Veba-Chemie AG. Tetraalkyl pyrazines from alkanolamines by copper-chromite catalysis. 3,925,378, Cl. 260-250.00B.
Vogt, Jes: *See—*
Engel, Claus Richard; Linke, Heinz; Rothbuhr, Lothar; Sroka, Werner; Vogt, Jes; and Westlinning, Hermann, 3,925,301.
Volkswagenwerk Aktiengesellschaft: *See—*
Decker, Gerd, 3,924,584.
Kalversberg, Manfred, 3,924,491.
Klemm, Peter; and Schulze, Klaus, 3,924,596.
Volper, Jean, to Millet Roux & Cie., Ltee. Wall structure for hospital rooms. 3,924,374, Cl. 52-243.000.
von Andrian-Werburg, Hanns Frhr.: *See—*
Heimke, Gunther; Griss, Peter; and von Andrian-Werburg, Hanns Frhr., 3,924,275.
von Bonin, Wulf: *See—*
Kleimann, Helmut; von Bonin, Wulf; Schneider, Heinz-Georg; and Gebauer, Herbert, 3,925,527.
von Bredow, Brigitta; and Brechbuhler, Hans U., to Ciba-Geigy Corporation. N-(substituted phenyl)-2,3-diazabicyclo[2.2.2]oct-5-ene and [2,2.1]hept-5-ene,2,3-dicarboximides. 3,925,379, Cl. 260-250.0AC.
von Kamp, Wilhelm: *See—*
Hoffmann, Friedrich; and von Kamp, Wilhelm, 3,924,711.
Voorhies, John Davidson, to American Cyanamid Company. Electrochemical oxidation and reduction. 3,925,172, Cl. 204-72.000.
Voss, Alfred: *See—*
Strunk, Manfred; Kroschel, Heinz; and Voss, Alfred, 3,924,510.
Vostovich, Joseph Edward: *See—*
Misiura, Thaddeus Dominick; Vostovich, Joseph Edward; and Wahl, Ralph Edward, 3,925,597.
Vrijssen, Gerardus Arnoldus Herman Maria, to U.S. Philips Corporation. Method of manufacturing a vacuum-tight electric leadthrough in an electric discharge tube. 3,924,792, Cl. 228-118.000.
Vyskumny ustav mechanizacie a automatizacie: *See—*
Fulier, Josef, 3,924,434.
Vyzkumny ustav bavlnarsky: *See—*
Esser, Miroslav; Ledr, Zdenek; Ferkl, Frantisek; Kubovy, Miloslav; Ripka, Josef; Hortlik, Frantisek; and Elias, Jiri, 3,924,398.
W. R. Grace & Co.: *See—*
DerMarderosian, Dikrun; and Tremblay, Paul Albert, 3,924,495.
DerMarderosian, Dikrun; and Tremblay, Paul Albert, 3,924,496.
Morgan, Charles R., 3,925,320.
Parthasarathy, R., 3,925,503.
Ritzi, Jack Henry, 3,925,231.
Scherzer, Julius; and Albers, Edwin Wolf, 3,925,195.
Wachsmuth, Robert H.: *See—*
Smith, Elliott P.; Wachsmuth, Robert H.; and Skolnick, Leonard, 3,924,941.
Wacker, Gerd, to Schottel-Werft Josef Becker KG. Device for reducing the thrust of steerable propellers. 3,924,556, Cl. 115-35.000.
Wada, Yasuhiro; and Okabe, Katsuhiko, to Kabushiki Kaisha Koparu. Channel indicating means for T.V. tuners. 3,925,778, Cl. 340-378.00R.
Wadhwani, Romesh Tekchand; and Pribadi, Krishnahadi Sikun. Security system. 3,925,763, Cl. 340-164.00R.
Wagner, Frank Albert, Jr.; and Addor, Roger Williams, to American Cyanamid Company. S-(α-Substituted-arylmethylthio, -arylmethylsulfinyl, and -arylmethylsulfonyl)methylphosphorus esters. 3,925,516, Cl. 260-940.000.
Wagner, Joseph Francis; Broderick, Ross Thomas; Link, Joseph Edward; and Stover, David Emmert, to Deere & Company. Grease fitting assembly including safety stop. 3,924,904, Cl. 305-10.000.
Wagner, Richard L.: *See—*
Boardman, Harold; Breslow, David S.; Simpson, David A.; and Wagner, Richard L., 3,924,520.
Wagner, Theodore: *See—*
Thoden, John; and Wagner, Theodore, 3,924,948.
Wahl, Ralph Edward: *See—*
Misiura, Thaddeus Dominick; Vostovich, Joseph Edward; and Wahl, Ralph Edward, 3,925,597.
Waiss, Anthony C., Jr.: *See—*
Randall, John M.; Hautala, Earl; Waiss, Anthony C., Jr.; and Kuhnle, Judith A., 3,925,192.
Waite, Frederick Andrew: *See—*
Osmond, Desmond Wilfrid John; Smith, Norman Douglas Patrick; and Waite, Frederick Andrew, 3,925,032.
Wakabayashi, Takashi: *See—*
Nagasawa, Mashahiro; Watanabe, Hiroyuki; and Wakabayashi, Takashi, 3,925,244.
Wakeman, Alfred W. Method of making pliable tape structures. 3,925,136, Cl. 156-252.000.
Walker, Frank H.; Blumer, Larry D.; Khouri, Robert N.; and Fulks, David G., to General Motors Corporation. Belt driven accessory for vehicles with automatic belt tensioner. 3,924,483, Cl. 74-242.11R.
Walker, James L.: *See—*
Ganslaw, Stuart Harold; and Walker, James L., 3,925,288.

Walker, Michael S.: *See—*
Bhate, Suresh K.; Spreadbury, Robert J.; Walker, Michael S.; and Young, Frederick J., 3,925,707.
Wallace, Raymond P.: *See—*
Loyd, Robert William, Jr.; and Wallace, Raymond P., 3,924,978.
Walldorf, Diann J., to Ethicon, Inc. Manufacture of controlled release fluid swellable sutures. 3,924,630, Cl. 128-339.000.
Walsh, John J.; and Chuang, Vincent T., to Union Carbide Corporation. Addition of pyridinium C_{12}-16 alkyl benzene sulfonate to gamma-methacryloxypropyltris (beta-methoxyethoxy)silane. 3,925,093, Cl. 106-287.0SB.
Walter Reis: *See—*
Reis, Walter; and Boll, Dietmar, 3,924,754.
Walter, Richard T., to Container Corporation of America. Apparatus for enclosing container groups. 3,924,385, Cl. 53-48.000.
Walter, Richard T.: *See—*
Bell, Richard L.; Walter, Richard T.; Botterman, David L.; and Lewis, Philip W., 3,924,736.
Wamsley, Vernon R.; and Cuhel, Gerald A., to Tonka Corporation. Toy vehicle kit having locking pin through engine, chassis and pan. 3,924,349, Cl. 46-17.000.
Wan, Chong T.: *See—*
Carmichael, Donald C.; Chambers, Douglas L.; and Wan, Chong T., 3,925,182.
Waniishi, Kenji; and Ninomiya, Koichiro, to Hitachi, Ltd. Cooking utensil. 3,924,838, Cl. 259-108.000.
Wanmaker, Willem Lambertus; and Radielovic, Dragutin, to U.S. Philips Corporation. Method of manufacturing a luminescent alkaline earth halophosphate. 3,925,239, Cl. 252-301.40P.
Ward, Dilys Annie Jane, administratrix: *See—*
Ward, Frederick H., deceased, 3,924,783.
Ward, Frederick H., deceased (by Ward, Dilys Annie Jane, administratrix), to Massey-Ferguson-Perkins Limited. Reversible hopper partition for combine drill. 3,924,783, Cl. 222-134.000.
Ward, William J., III; and Foss, William I., to General Electric Company. High pressure membrane package construction. 3,925,037, Cl. 55-158.000.
Wardlow, Eddie, Jr., to Standard Oil Company, The. Thermally-stable high nitrile resins and method for producing the same. 3,925,305, Cl. 260-45.9NC.
Warriner, Robert E.: *See—*
Gesser, Hymie D.; and Warriner, Robert E., 3,925,178.
Warwick, Peter Stephen: *See—*
Cardwell, Robert Edward; Carlson, David Emory; Davis, Robert Leon; McNamara, Edward Joseph; Pilc, Randolph John; Schlanger, Gabriel Gary; Tutelman, David Morris; Warwick, Peter Stephen; and Zydney, Herbert Mortimer, 3,925,601.
Wasco Products, Inc.: *See—*
Anghinetti, Joseph R.; Couture, Paul A.; and Jentoft, Arthur P., 3,924,372.
Wasser-Sand-Forschungs-U. Vertriebs G.m.b.H.: *See—*
Strauven, Kurt, 3,925,210.
Watanabe, Hiroyuki: *See—*
Nagasawa, Mashahiro; Watanabe, Hiroyuki; and Wakabayashi, Takashi, 3,925,244.
Watanabe, Jinzo; Terao, Noboru; Kamahara, Koichi; Miyashita, Kazuhisa; and Fujihira, Kenji, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device. 3,925,802, Cl. 357-20.000.
Watanabe, Mikio; and Ohtori, Keizo. Apparatus for treating cloth with liquid. 3,924,424, Cl. 68-177.000.
Watanabe, Mikio: *See—*
Tanaka, Hideki; Watanabe, Mikio; Handa, Minoru; Inouchi, Mitsuhiro; Yoshioka, Shigeru; and Ishida, Kazutaka, 3,925,732.
Watts, Geoffrey Brian: *See—*
Showalter, Lane Crawford; Brokenshire, John Leslie; and Watts, Geoffrey Brian, 3,925,022.
Weatherhead Company, The: *See—*
Frank, Irving G., 3,924,883.
Webb, Alan David, to British Petroleum Company Limited, The. Holder for electrical equipment. 3,925,592, Cl. 174-17.0LF.
Webster, James A.: *See—*
United States of America, National Aeronautics and Space Administration; and Webster, James A., 3,925,312.
Wei, Peter H. L.; and McCaully, Ronald J., to American Home Products Corporation. 2-Thiocyanatoalkyl and aralkylcarboxamido cephalosporanic and penicillanic acid derivatives. 3,925,370, Cl. 260-243.00C.
Weigert, Wolfgang: *See—*
Geiger, Friedhelm; Heimberger, Werner; Schreyer, Gerd; and Weigert, Wolfgang, 3,925,377.
Weigl, Erwin, to Gertsch AG. Braking mechanism for skis. 3,924,864, Cl. 280-11.13B.
Weigl, John W., to Xerox Corporation. Apparatus for inductive imaging with simultaneous polar ink development. 3,924,945, Cl. 355-10.000.
Weiler, Ernest D.: *See—*
Kilbourn, Edward E.; and Weiler, Ernest D., 3,925,397.
Weinman, James A.; and Stearns, Charles R. Emission control method and apparatus for smokestacks or other waste gas discharge stacks. 3,924,605, Cl. 126-307.00A.
Weinstein, Bernard: *See—*
Corey, Garland G.; and Weinstein, Bernard, 3,925,227.
Weir, Donald Robert; and Evans, David John Ivor, to Sherritt Gordon Mines Limited. Process for treating nickeliferous laterite ore containing limonite and serpentine fractions. 3,925,533, Cl. 423-150.000.
Weisfeld, Lewis B.; and Witman, Robert C., to Cincinnati Milacron Chemicals Inc. Dimethyltin esters. 3,925,309, Cl. 260-45.75S.
Weiss, Francis J.: *See—*
Bader, Andre A.; and Weiss, Francis J., 3,925,493.
Weiss, Gerhard T., to Axotronics Inc. Bi-phasic current stimulation system. 3,924,641, Cl. 128-419.0PG.
Welch, Willard M., Jr.; and Harbert, Charles A., to Pfizer Inc. 4-Aryl-1,2,3,4-tetrahydropyrrolo[3,4-b]indoles. 3,925,409, Cl. 260-326.50B.
Wells Manufacturing Corporation: *See—*
Alexander, Carl J., 3,924,390.
Welter, Leonard M.: *See—*
Coates, Vincent J.; and Welter, Leonard M., 3,925,664.
Wendel, Lorenz A., to Singer Company, The. Motor drive for sewing machines. 3,924,552, Cl. 112-217.100.
Wendler, Norman L.; and Taub, David, to Merck & Co., Inc. 5-Cyclic ethylene acetals of 5-oxocyclopentane heptanoic acids and esters. 3,925,419, Cl. 260-340.900.
Wentzheimer, William W., to Sun Oil Company of Pennsylvania. Combined acid alkylation and thermal cracking process. 3,925,500, Cl. 260-683.440.
Wenzelburger, Hans Jurgen: *See—*
Jager, Gerhard; Wenzelburger, Hans Jurgen; and Schmidt, Robert R., 3,925,386.
Werner, Arthur W., to Macartney, Earle M.; and Macartney, Marjorie. Electric incinerator with electrostatic filter. 3,924,547, Cl. 110-8.00E.
Werner & Pfleiderer: *See—*
Millauer, Christian, 3,924,839.
Wesfalia Separator AG: *See—*
Niemeyer, Heinrich, 3,924,804.
West, Jerry B.: *See—*
McLaughlin, Charles R.; and West, Jerry B., 3,925,749.
Western Company of North America, The: *See—*
McLaughlin, Charles R.; and West, Jerry B., 3,925,749.
Western Electric Company, Inc.: *See—*
Austin, James Raymond; Brown, Martin John; and Loan, Leonard Donald, 3,925,671.
Fuchs, Francis Joseph, Jr., 3,924,429.
Moscioni, Richard Joseph; and Sellar, Gerald Miller, 3,924,920.
Prematta, Robert Joseph; and Venkatesan, Peruvemba Swaminatha, 3,925,110.
Vahaviolos, Sotirios John, 3,924,456.
Westfall, Darrell L.: *See—*
Meshri, Dayal T.; and Westfall, Darrell L., 3,925,539.
Westinghouse Electric Corporation: *See—*
Berman, Paul A.; Giras, Theodore C.; and Crews, Roy E., 3,925,679.
Bhate, Suresh K.; Spreadbury, Robert J.; Walker, Michael S.; and Young, Frederick J., 3,925,707.
Blewitt, Donald D., 3,925,745.
Boundy, Bruce K., 3,924,829.
Buzzelli, Edward S., 3,925,100.
Cleaveland, Charles M., 3,925,599.
Cricchi, James Ronald; and Ruehling, Barry W., 3,925,804.
Elms, Robert T.; and Keck, Merle E., 3,925,705.
Fatzer, Elmer G.; and Kochka, Edgar L., 3,925,577.
Frank, Stanley L.; and Dobrosielski, Stephen S., 3,925,632.
Lehmann, Willi, 3,925,240.
Leschek, Walter C.; and McShane, James L., 3,925,692.
Matlock, Thomas D.; and Smith, Kenneth R., 3,924,316.
Mitchell, James T.; and Billings, William W., 3,925,709.
Rai-Choudhury, Prosenjit, 3,925,808.
Sprengling, Gerhard R., 3,925,297.
Stern, Louis P., 3,925,645.
Van Nice, Robert I., 3,925,743.
Whyte, Ian A., 3,925,728.
Wood, Kenneth E.; Parrish, William F.; and Kennedy, Paul G., 3,925,606.
Westlinning, Hermann: *See—*
Engel, Claus Richard; Linke, Heinz; Rothbuhr, Lothar; Sroka, Werner; Vogt, Jes; and Westlinning, Hermann, 3,925,301.
Weston Instruments, Inc.: *See—*
Andreaggi, Joseph R.; and Zenuch, George, 3,924,775.
Weston, Roy Bernard. Display device. 3,924,749, Cl. 211-4.000.
Whall, James M., to Polaroid Corporation. Spread roller system for self developing type photographic apparatus. 3,925,800, Cl. 354-301.000.
Whisler, Edwin Lee, to Deere & Company. Cab configuration for strategically housing an environmental control unit on an articulated vehicle. 3,924,524, Cl. 98-2.110.
Whitcombe, John A.; Van Zanten, Kenneth D.; and Kane, George C., to Oil Shale Corporation, The. Preheating oil shale prior to pyrolysis thereof. 3,925,190, Cl. 208-11.000.
White, Duane D.: *See—*
Caldwell, Samuel I.; Orr, Robert S.; and White, Duane D., 3,924,485.
White, John R.: *See—*
Kerho, Stephen E.; Lindquist, Claude S.; White, John R.; and Breen, Bernard P., 3,924,442.
White, Joseph Paul; and Del Priore, Paul Joseph, to RCA Corporation. Method of shaping semiconductor workpieces. 3,924,361, Cl. 51-283.000.
Whitehouse, Harper J.: *See—*
Speiser, Jeffrey M.; Whitehouse, Harper J.; and Alsup, James M., 3,925,648.

Whitehouse, Hugh L., to Stanley Works, The. Fluid operated tool having self-compensating throttle valve. 3,924,693, Cl. 173-169.000.

Whitehurst, Darrell D.: *See—*
Rodewald, Paul G.; and Whitehurst, Darrell D., 3,925,194.
Rodewald, Paul G.; and Whitehurst, Darrell D., 3,925,251.

Whitesides, Thomas: *See—*
Fitton, Peter; and Whitesides, Thomas, 3,925,249.

Whitney, Wells: *See—*
Kimmel, Robert M.; Riggs, John P.; Swander, Robert W.; and Whitney, Wells, 3,925,524.

Whitworth, Clyde Jesse, Jr.: *See—*
Koleske, Joseph Victor; Whitworth, Clyde Jesse, Jr.; and Lundberg, Robert Dean, 3,925,504.

Whyte, Ian A., to Westinghouse Electric Corporation. Induction watthour meter for power systems transmitting carrier communication signals. 3,925,728, Cl. 324-142.000.

Wicks, Moye, III, to Shell Oil Company. Pipeline processing of oil-containing solids to recover hydrocarbons. 3,925,189, Cl. 208-11.000.

Wiemer, Willem; and Besier, Mattheus, to B. V. Koninklijke Machinefabriek. Water degassing device. 3,925,038, Cl. 55-159.000.

Wienhold, James L., to CPT Corporation. Typewriter with electronic keyboard. 3,924,722, Cl. 197-19.000.

Wiesenewsky, Karl-Heinz, to Licentia Patent-Verwaltungs-G.m.b.H. Memory device. 3,925,764, Cl. 340-168.00R.

Wilbur, Everett T.: *See—*
Berwin, Ted W.; and Wilbur, Everett T., 3,925,765.

Wiles, Donald Ray: *See—*
Sandor, Louis; Germain, Andrew Gerald; Wiles, Donald Ray; and Filippini, Ronald A., 3,924,422.

Wilfrid Overton Limited: *See—*
Christie, John James Watson, 3,924,884.

Wilkerson, James E., to Odom Sausage Co. Inc. of Kentucky. Method of preparing molded meat products. 3,924,296, Cl. 17-45.000.

Wilkinson, Nelson C. Fuel tank. 3,924,773, Cl. 220-88.00B.

Williams, Albert Lloyd: *See—*
Heiba, EL-Ahmadi Ibrahim; and Williams, Albert Lloyd, 3,925,232.

Williams, Lary Lynn, to Deere & Company. Folding bench-type seat for a motor grader. 3,924,891, Cl. 297-334.000.

Williams, Virgil Lynn: *See—*
Ruthart, Leonard Crawford; and Williams, Virgil Lynn, 3,924,561.

Williams, Walter A.; and Silvestri, Herbert H., to Bristol-Myers Company. Hemisolvate of D-(-)-2-(p-hydroxyphenyl)glycyl chloride hydrochloride and process. 3,925,418, Cl. 260-340.600.

Wilpers, Dale J., to Shell Oil Company. Quenching oil composition. 3,925,113, Cl. 148-29.000.

Wilson, David B.: *See—*
Rabinowitz, Azriel J.; and Wilson, David B., 3,924,894.

Wilson, Stewart W.; and Ericson, John W., to Polaroid Corporation. Interactive teaching system. 3,924,339, Cl. 35-8.00R.

Wilson, William W. Method and composition for candle making. 3,925,029, Cl. 44-7.500.

Wingender, Kaspar; and Vetter, Hans, to Agfa-Gevaert Aktiengesellschaft. Photographic dye diffusion transfer process using silver salt transfer for reversal. 3,925,075, Cl. 96-3.000.

Winston, Anthony E. B., to Church & Dwight Co., Inc. Detergent additive composition. 3,925,224, Cl. 252-89.000.

Winston, Herbert. Wrist exercise device. 3,924,851, Cl. 272-67.000.

Wisconsin Alumni Research Foundation: *See—*
Updike, Stuart J., 3,925,017.

Wise, James C.; and Fernandez-Rana, Victoriano, to Harris-Intertype Corporation. Collating method. 3,924,845, Cl. 270-54.000.

Wisecup, David R.: *See—*
Bussard, Charles B.; Hamisch, Paul H., Sr.; and Wisecup, David R., 3,924,523.

Wissbrun, Kurt F.: *See—*
Forschirm, Alex S.; and Wissbrun, Kurt F., 3,925,006.

Witman, Robert C.: *See—*
Weisfeld, Lewis B.; and Witman, Robert C., 3,925,309.

Witte, Henry C., to International Comador of Memphis, Inc. Dispenser apparatus suspended for bottom discharge. 3,924,781, Cl. 222-80.000.

Witteles, Abraham A.; and Putterman, Harry, to Singer Company, The. Radiation set thermally reset read-only-memory. 3,925,767, Cl. 340-173.0LM.

Wittlinger, Harold Allen, to RCA Corporation. Current mirror and degenerative amplifier. 3,925,718, Cl. 323-4.000.

Wladis, S. Anton. Rail wheel stop. 3,924,539, Cl. 104-258.000.

Wohlkonig, Alexander; Hindermann, Peter; Beffa, Fabio; and Hegar, Gert, to Ciba-Geigy AG. Azonaphthimidazole compounds. 3,925,348, Cl. 260-157.000.

Woiszwillo, James E.: *See—*
Piasio, Roger N.; and Woiszwillo, James E., 3,925,355.

Wolcott, Robert M. Driving gear and feeding mechanism. 3,924,476, Cl. 74-30.000.

Wolf, Gerhard Dieter; Kunzel, Hans Egon; Blankenstein, Gunther; Kleinschmidt, Peter; and Bentz, Francis, to Bayer Aktiengesellschaft. High molecular weight copolyamides containing hydantoin units. 3,925,310, Cl. 260-47.0CZ.

Wolf, Harold G.: *See—*
Hiatt, Norman A.; Wolf, Harold G.; and Hlavacek, Robert A., 3,925,319.

Wolf, Richard: *See—*
Hess, Johann; Paule, Kurt; Latzina, Kurt; and Wolf, Richard, 3,924,961.

Wolf, Warren W., to Owens-Corning Fiberglas Corporation. Core glass for fiber optics. 3,924,927, Cl. 350-96.00B.

Wolfram, Roland, to Siemens Aktiengesellschaft. Electron beam collector electrode for an electron beam tube. 3,925,701, Cl. 315-5.380.

Wolfrum, Gerhard; Sommer, Richard; and Klauke, Erich, to Bayer Aktiengesellschaft. Phenyl-azo-indole compounds. 3,925,350, Cl. 260-165.000.

Wollweber, Hartmund; and Flucke, Winfried, to Bayer Aktiengesellschaft. Aminophenylamidines, their production and their medicinal use. 3,925,470, Cl. 260-564.0RF.

Wollweber, Hartmund; and Flucke, Winfried, to Bayer Aktiengesellschaft. Aminophenylamidines their production and their medicinal use. 3,925,471, Cl. 260-564.0RF.

Wood, Charles D., III: *See—*
Colburn, John W., Jr.; Wood, Charles D., III; Mathis, Ronald J.; and Nye, Allan R., 3,924,897.

Wood, Edward Russell: *See—*
Shaul, Anthony James; and Wood, Edward Russell, 3,925,138.

Wood, Kenneth E.; Parrish, William F.; and Kennedy, Paul G., to Westinghouse Electric Corporation. Scan conversion apparatus. 3,925,606, Cl. 178-6.800.

Wood, Prentice J., to Mead Corporation, The. Article carrier. 3,924,740, Cl. 206-187.000.

Woodall-Duckham, Limited: *See—*
Singleton, Frank Henry; and Bruce, Jack William, 3,925,534.

Woodbury, Henry H.; and Lewandowski, Robert S., to General Electric Company. Method for preparing decomposable materials with controlled resistivity. 3,925,108, Cl. 156-618.000.

Woodhams, Glen Arthur, to Sybron Corporation. Distribution valve for dental equipment. 3,924,660, Cl. 137-637.100.

Woodruff, Benjamin T., to Du Pont de Nemours, E. I., and Company. Formaldehyde-hexamethylene tetramine compositions. 3,925,233, Cl. 252-182.000.

Woods, Robert L., to Eagle-Motive Industries, Inc. Electromagnetic fan clutch for a water-cooled vehicle engine. 3,924,585, Cl. 123-41.120.

Woodward, Gary F.; and Vanderberg, Lawrence J., to Ford Motor Company. Fuel sender mechanism for a motor vehicle. 3,925,747, Cl. 338-33.000.

Woodworth, William H.; and Cunningham, Robert D., to United States of America, Navy. Pressure sensitive control device. 3,924,458, Cl. 73-133.00R.

Wright, Carl Edward: *See—*
Story, Paul Richard; Busch, Peter; Denson, Donald Derby; and Wright, Carl Edward, 3,925,421.

Wright, John S. Flexible film transparency display makers. 3,924,879, Cl. 282-28.00R.

Wright, Joseph E., Jr. Apparatus for generating heavy oxygen molecules. 3,925,673, Cl. 250-432.000.

Wright, William L.: *See—*
Meyer, Edward P.; and Wright, William L., 3,924,452.

Wu, Ching H.; Brown, Alfred; Huang, Wann-Sheng; and Shum, Yick-Mow, to Texaco Inc. Method of treating a high temperature formation to permit the use therein of temperature sensitive surfactants. 3,924,682, Cl. 166-274.000.

Wuestenhoefer, William C.: *See—*
Philbrick, John W.; and Wuestenhoefer, William C., 3,925,119.

Wuetig, Ralph T., to Signode Corporation. Indexing table advance mechanism. 3,924,720, Cl. 197-6.500.

Wygant, James C.: *See—*
Green, Richard L.; and Wygant, James C., 3,925,217.

Wyhof, John R., to ICI United States Inc. Electrophotographic elements containing dielectric resins as binders. 3,925,074, Cl. 96-1.800.

Xerox Corporation: *See—*
Bar-on, Ari, 3,924,564.
Dennie, Richard H., 3,924,566.
Fletcher, Gerald M., 3,924,943.
Jeromin, Lothar S., 3,924,568.
Smith, Richard E.; and Bresnick, Herbert L., 3,924,944.
Weigl, John W., 3,924,945.

Yabuta, Tozo; Kaneko, Yasuhisa; and Morita, Akiyoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Catalyzer apparatus and method for the production thereof. 3,925,252, Cl. 252-447.000.

Yagi, Shizuo; Miyaki, Kiyoshi; and Kogure, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. Auxiliary chambers for internal combustion piston engines. 3,924,582, Cl. 123-32.0SP.

Yamada Kagaku Kenkyusho Co., Ltd.: *See—*
Tsunemitsu, Katsuhiko; Kiuchi, Kanji; Nakai, Yasushi; Kawai, Hajime; and Yamada, Shimpei, 3,925,457.

Yamada, Katsuto: *See—*
Suzuki, Nagayuki; Nakamura, Tsutomu; and Yamada, Katsuto, 3,925,584.

Yamada, Shigeki: *See—*
Chibata, Ichiro; Yamada, Shigeki; and Yamamoto, Masao, 3,925,454.

Yamada, Shimpei: *See—*
Tsunemitsu, Katsuhiko; Kiuchi, Kanji; Nakai, Yasushi; Kawai, Hajime; and Yamada, Shimpei, 3,925,457.

Yamada, Tateo; and Uchidoi, Masanori, to Canon Kabushiki Kaisha. Film projection system having attachment device capable of switching different selected modes of projection. 3,924,942, Cl. 353-25.000.

Yamagata, Toshiaki: *See—*
Takamura, Akira; Shimogori, Kazutoshi; Yamagata, Toshiaki; Sato, Masao; and Kitanata, Koziro, 3,925,064.
Yamahara, Takeshi; and Usui, Masahiro, to Sumitomo Chemical Company, Limited. Process for production of aromatic isocyanates. 3,925,436, Cl. 260-453.0PC.
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, to Sumitomo Chemical Company, Ltd. Benzodiazepine derivatives. 3,925,364, Cl. 260-239.30D.
Yamamoto, Hisao: *See—*
Ishizumi, Kikuo; Mori, Kazuo; Yamamoto, Michihiro; Koshiba, Masao; Inaba, Shigeho; and Yamamoto, Hisao, 3,925,382.
Maruyama, Isamu; Nakao, Masaru; Sasajima, Kikuo; Ono, Keiichi; Takayama, Masaharu; Katayama, Shigenari; Tanaka, Yoshihiro; Yanagihara, Izumi; Inaba, Shigeho; and Yamamoto, Hisao, 3,925,387.
Yamamoto, Masao: *See—*
Chibata, Ichiro; Yamada, Shigeki; and Yamamoto, Masao, 3,925,454.
Yamamoto, Michihiro: *See—*
Ishizumi, Kikuo; Mori, Kazuo; Yamamoto, Michihiro; Koshiba, Masao; Inaba, Shigeho; and Yamamoto, Hisao, 3,925,382.
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,925,364.
Yamamoto, Mititaka, to Omron Corporation of America. Liquid crystal display utilizing reflected light. 3,924,932, Cl. 350-160.0LC.
Yamamoto, Takeshi, to Mitsubishi Denki Kabushiki Kaisha. Method of electrically depositing glass particles on objective body. 3,925,179, Cl. 204-181.000.
Yamazaki, Masami: *See—*
Musashi, Akira; Yamazaki, Masami; and Hiruta, Makoto, 3,925,275.
Yamazaki, Mitsuo: *See—*
Sakai, Kiyoshi; Inoue, Kenji; Tajima, Yawara; Yamazaki, Mitsuo; Ohuchi, Kazuo; and Yusa, Takashi, 3,925,451.
Yanagihara, Izumi: *See—*
Maruyama, Isamu; Nakao, Masaru; Sasajima, Kikuo; Ono, Keiichi; Takayama, Masaharu; Katayama, Shigenari; Tanaka, Yoshihiro; Yanagihara, Izumi; Inaba, Shigeho; and Yamamoto, Hisao, 3,925,387.
Yananton, Patrick Michael: *See—*
Cekoric, Thomas, Jr.; and Yananton, Patrick Michael, 3,925,163.
Yang, James H. C.; and Beneze, Heinz W., to Firestone Tire & Rubber Company, The. Centrifugal tire casting machine. 3,924,982, Cl. 425-35.000.
Yara Engineering Corporation: *See—*
Chapman, John H.; Smith, Randolph O.; and Josey, Verlon E., 3,924,813.
Yarnold, Daniel J., to Memphis Metal Manufacturing Company, Inc. Apparatus for flaring edges of circular openings. 3,924,432, Cl. 72-123.000.
Yasuda, Shoji. Differential type automatic speed changing apparatus including variable speed torque converter. 3,924,489, Cl. 74-688.000.
Yeakey, Ernest Leon; and Austin, Thomas Howard, to Jefferson Chemical Company, Inc. Preparation of aminoethylpiperazines. 3,925,389, Cl. 260-268.0SY.
Yendrich, Stephen P., Jr.: *See—*
Barton, Dale S.; and Yendrich, Stephen P., Jr., 3,924,983.
Yetter, Harry G.: *See—*
Baughman, Herbert W.; and Yetter, Harry G., 3,924,694.
Yoshida, Eiji; and Hayashi, Yoshimasa, to Nihon Cement Company Limited. Method and an apparatus for burning the material for the manufacture of cement. 3,925,091, Cl. 106-100.000.
Yoshida Kogyo Kabushiki Kaisha: *See—*
Oda, Kiyoshi, 3,924,306.
Yoshida, Kouichi: *See—*
Ishida, Torao; Ohoishi, Junichi; Yoshida, Kouichi; Akashi, Kageyasu; Takeda, Isao, deceased; and Takeda, Emiko, legal representative, 3,925,415.
Yoshikawa, Kazuo: *See—*
Toyama, Seiji; Yoshikawa, Kazuo; and Higuchi, Takeshi, 3,925,813.
Yoshimura, Isao: *See—*
Naito, Hirokuni; Yoshimura, Isao; and Nakano, Hiroo, 3,925,332.
Yoshino, Masataka; Kuwazawa, Hiroyasu; Shimojima, Haruhiko; Tanaka, Osamu; Kusakawa, Hideaki; Matsuoka, Hiromasa; and Maeda, Mitsuo, to Mitsubishi Denki Kabushiki Kaisha. Apparatus comprising a plurality of chemically treated absorption plates for injurious gases contained in the air. 3,925,021, Cl. 23-252.00R.
Yoshioka, Shigeru: *See—*
Tanaka, Hideki; Watanabe, Mikio; Handa, Minoru; Inouchi, Mitsuhiro; Yoshioka, Shigeru; and Ishida, Kazutaka, 3,925,732.
Yoshioka, Taisuke: *See—*
Naruse, Yosuke; Yoshioka, Taisuke; Himuro, Masami; and Ito, Keiichi, 3,925,603.
Yoshioka, Yoshihide, to Gomei Kaisha Touyo Shoji. Bulky paper and method of making same. 3,925,127, Cl. 156-85.000.
Yoshizaki, Shuji: *See—*
Esashi, Hanjiro; and Yoshizaki, Shuji, 3,925,820.
Yost, Kenneth J., to Coate Burial Vault, Inc. Aerobic sewage treatment system. 3,925.208, Cl. 210-199.000.
Young, Charles G. Balustrade units. 3,924,834, Cl. 256-22.000.
Young, Frederick J.: *See—*
Bhate, Suresh K.; Spreadbury, Robert J.; Walker, Michael S.; and Young, Frederick J., 3,925,707.
Young, Robert E.: *See—*
Julian, Clarence L.; and Young, Robert E., 3,924,586.
Youngblood, Hugh A., Jr. Retractable overhead carriage for carrying cargo atop a vehicle. 3,924,764, Cl. 214-450.000.
Youngren, Fred R.: *See—*
Bleday, Michael P.; and Youngren, Fred R., 3,925,783.
Yusa, Takashi: *See—*
Sakai, Kiyoshi; Inoue, Kenji; Tajima, Yawara; Yamazaki, Mitsuo; Ohuchi, Kazuo; and Yusa, Takashi, 3,925,451.
Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See—*
Umezawa, Hamao; Umezawa, Sumio; and Tsuchiya, Osamu, 3,925,353.
Umezawa, Hamao; Umezawa, Sumio; and Tsuchiya, Osamu, 3,925,354.
Zane, Ernest; and Zane, Michael S. Lock for bicycles and the like. 3,924,426, Cl. 70-18.000.
Zane, Michael S.: *See—*
Zane, Ernest; and Zane, Michael S., 3,924,426.
Zbrojovka Vsetin, narodni podnik: *See—*
Kovar, Stanislav; Cernocky, Jiri; and Riha, Petr, 3,924,820.
Zech, John D.: *See—*
Rutledge, Thomas F.; and Zech, John D., 3,925,009.
Zemke, Bruce E.: *See—*
Bond, William D.; and Zemke, Bruce E., 3,924,591.
Zenith Radio Corporation: *See—*
Rennick, John L., 3,925,605.
Zenuch, George: *See—*
Andreaggi, Joseph R.; and Zenuch, George, 3,924,775.
Zerrer, Dieter G. Turbomachine. 3,924,963, Cl. 415-143.000.
Ziegler, Donald L., to United States of America, Energy Research and Development Administration. System for treating flue gas. 3,925,039, Cl. 55-223.000.
Zimane, Zdenek: *See—*
Dahm, Johann; Borck, Joachim; Nowak, Herbert; Zimane, Zdenek; and Kayser, Detlev, 3,925,394.
Zimmerman, Gilbert A.: *See—*
Cohen, Joseph; and Zimmerman, Gilbert A., 3,924,405.
Zinpro Corporation: *See—*
Abdel-Monem, Mahmond M.; and Anderson, Dean R., 3,925,433.
Zinser Textilmaschinen GmbH: *See—*
Igel, Wolfgang, 3,924,762.
Zipay, Albert John, to Foster Wheeler Energy Corporation. Fluid heating and separating apparatus. 3,924,575, Cl. 122-34.000.
Zipperian, Donald Edwin; Jones, James Allen; and Buza, Thomas Brian, to American Cyanamid Company. Concentration of ore by flotation with solutions of aqueous dithiophosphates and thionocarbamate as collector. 3,925,218, Cl. 252-61.000.
Zivi, Edwin L., Jr.: *See—*
Howard, Robert G.; and Zivi, Edwin L., Jr., 3,924,448.
Zobbi, Robert G.: *See—*
Skomoroski, Robert M.; and Zobbi, Robert G., 3,925,170.
Zoecon Corporation: *See—*
Henrick, Clive A.; and Staal, Gerardus B., 3,925,460.
Henrick, Clive A.; and Staal, Gerardus B., 3,925,461.
Zorayan, Vahan: *See—*
Kalopissis, Gregoire; Bugaut, Andree; and Zorayan, Vahan, 3,925,474.
zur Hausen, Manfred: *See—*
Reich, Manfred; Muller, Wolfgang; and zur Hausen, Manfred, 3,925,490.
Zydney, Herbert Mortimer: *See—*
Cardwell, Robert Edward; Carlson, David Emory; Davis, Robert Leon; McNamara, Edward Joseph; Pilc, Randolph John; Schlanger, Gabriel Gary; Tutelman, David Morris; Warwick, Peter Stephen; and Zydney, Herbert Mortimer, 3,925,601.
Zyduck, Ronald L.: *See—*
Lamer, Gerald P.; Zyduck, Ronald L.; and Roesler, David F., 3,924,753.

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DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 24,017	3,914,140	Oct. 21, 1975
B 24,018	3,914,206	Oct. 21, 1975
B 64,868	3,914,141	Oct. 21, 1975
B 78,331	3,914,142	Oct. 21, 1975
B 112,422	3,913,484	Oct. 21, 1975
B 150,560	3,913,654	Oct. 21, 1975
B 176,995	3,915,773	Oct. 28, 1975
B 189,772	3,925,367	Dec. 9, 1975
B 189,773	3,925,405	Dec. 9, 1975
B 190,679	3,925,346	Dec. 9, 1975
B 198,810	3,916,043	Oct. 28, 1975
B 204,161	3,924,605	Dec. 9, 1975
B 207,272	3,914,123	Oct. 21, 1975
B 211,786	3,914,300	Oct. 21, 1975
B 213,211	3,925,269	Dec. 9, 1975
B 220,683	3,914,471	Oct. 21, 1975
B 222,188	3,914,739	Oct. 21, 1975
B 223,621	3,925,526	Dec. 9, 1975
B 224,323	3,925,476	Dec. 9, 1975
B 233,383	3,925,424	Dec. 9, 1975
B 233,741	3,925,326	Dec. 9, 1975
B 235,011	3,925,086	Dec. 9, 1975
B 235,925	3,924,949	Dec. 9, 1975
B 236,609	3,925,187	Dec. 9, 1975
B 237,953	3,924,051	Dec. 2, 1975
B 239,289	3,922,711	Nov. 25, 1975
B 241,433	3,923,711	Dec. 2, 1975
B 245,194	3,919,179	Nov. 11, 1975
B 248,916	3,920,862	Nov. 18, 1975
B 251,109	3,914,148	Oct. 21, 1975
B 251,635	3,914,149	Oct. 21, 1975
B 252,947	3,923,803	Dec. 2, 1975
B 254,211	3,917,677	Nov. 4, 1975
B 254,708	3,923,878	Dec. 2, 1975
B 255,756	3,923,781	Dec. 2, 1975
B 256,334	3,924,988	Dec. 9, 1975
B 256,936	3,925,513	Dec. 9, 1975
B 258,687	3,914,221	Oct. 21, 1975
B 259,236	3,924,874	Dec. 9, 1975
B 260,455	3,925,634	Dec. 9, 1975
B 260,945	3,925,250	Dec. 9, 1975
B 261,378	3,913,468	Oct. 21, 1975
B 261,828	3,925,551	Dec. 9, 1975
B 262,241	3,925,528	Dec. 9, 1975
B 262,287	3,921,209	Nov. 18, 1975
B 262,378	3,914,410	Oct. 21, 1975
B 264,833	3,923,566	Dec. 2, 1975
B 265,369	3,925,245	Dec. 9, 1975
B 265,727	3,914,479	Oct. 21, 1975
B 265,862	3,915,915	Oct. 28, 1975
B 266,195	3,923,599	Dec. 2, 1975
B 269,673	3,914,377	Oct. 21, 1975
B 270,089	3,923,875	Dec. 2, 1975
B 271,104	3,925,400	Dec. 9, 1975
B 274,945	3,924,992	Dec. 9, 1975
B 275,426	3,925,168	Dec. 9, 1975
B 276,271	3,916,028	Oct. 28, 1975
B 276,560	3,916,030	Oct. 28, 1975
B 277,449	3,924,048	Dec. 2, 1975
B 278,491	3,921,170	Nov. 18, 1975
B 278,991	3,914,469	Oct. 21, 1975
B 279,583	3,923,749	Dec. 2, 1975
B 280,015	3,925,378	Dec. 9, 1975
B 280,395	3,919,604	Nov. 11, 1975
B 281,341	3,920,643	Nov. 18, 1975
B 281,943	3,924,013	Dec. 2, 1975
B 282,081	3,913,483	Oct. 21, 1975
B 282,252	3,924,997	Dec. 9, 1975
B 283,124	3,923,512	Dec. 2, 1975
B 283,300	3,925,011	Dec. 9, 1975
B 284,297	3,913,722	Oct. 21, 1975
B 285,200	3,923,680	Dec. 2, 1975
B 285,796	3,914,303	Oct. 21, 1975
B 286,499	3,914,129	Oct. 21, 1975
B 286,614	3,924,696	Dec. 9, 1975
B 287,164	3,914,139	Oct. 21, 1975
B 287,270	3,924,825	Dec. 9, 1975
B 287,275	3,925,141	Dec. 9, 1975
B 287,373	3,918,568	Nov. 11, 1975
B 288,018	3,925,239	Dec. 9, 1975
B 288,627	3,916,179	Oct. 28, 1975
B 288,638	3,925,132	Dec. 9, 1975
B 289,175	3,924,309	Dec. 9, 1975
B 289,471	3,917,184	Nov. 4, 1975
B 289,523	3,921,166	Nov. 18, 1975
B 289,883	3,925,063	Dec. 9, 1975
B 290,328	3,924,838	Dec. 9, 1975
B 291,104	3,925,007	Dec. 9, 1975
B 291,694	3,925,339	Dec. 9, 1975
B 292,054	3,915,877	Oct. 28, 1975
B 292,126	3,914,465	Oct. 21, 1975
B 292,140	3,914,340	Oct. 21, 1975
B 292,563	3,923,653	Dec. 2, 1975
B 293,378	3,923,725	Dec. 2, 1975
B 293,437	3,913,414	Oct. 21, 1975
B 294,103	3,924,396	Dec. 9, 1975
B 294,579	3,916,737	Nov. 4, 1975
B 294,673	3,916,023	Oct. 28, 1975
B 295,481	3,921,593	Nov. 25, 1975
B 295,674	3,916,107	Oct. 28, 1975
B 295,860	3,923,880	Dec. 2, 1975
B 299,267	3,917,106	Nov. 4, 1975
B 300,353	3,921,734	Nov. 25, 1975
B 302,692	3,924,598	Dec. 9, 1975
B 302,836	3,923,573	Dec. 2, 1975
B 303,655	3,924,642	Dec. 9, 1975
B 303,702	3,914,131	Oct. 21, 1975
B 304,687	3,924,783	Dec. 9, 1975
B 305,417	3,915,882	Oct. 28, 1975
B 305,868	3,921,463	Nov. 25, 1975
B 305,881	3,923,478	Dec. 2, 1975
B 306,829	3,925,411	Dec. 9, 1975
B 306,938	3,916,050	Oct. 28, 1975
B 307,677	3,915,276	Oct. 28, 1975
B 308,661	3,924,349	Dec. 9, 1975
B 308,892	3,919,624	Nov. 11, 1975
B 309,207	3,914,743	Oct. 21, 1975
B 309,499	3,922,002	Nov. 25, 1975
B 309,755	3,919,468	Nov. 11, 1975
B 309,756	3,914,136	Oct. 21, 1975
B 309,860	3,922,485	Nov. 25, 1975
B 310,149	3,924,705	Dec. 9, 1975
B 310,271	3,923,689	Dec. 2, 1975
B 311,313	3,925,142	Dec. 9, 1975
B 311,317	3,918,975	Nov. 11, 1975
B 311,413	3,925,515	Dec. 9, 1975
B 311,910	3,924,357	Dec. 9, 1975
B 311,911	3,925,233	Dec. 9, 1975
B 312,139	3,925,530	Dec. 9, 1975
B 312,477	3,923,714	Dec. 2, 1975
B 313,098	3,925,045	Dec. 9, 1975
B 313,531	3,925,548	Dec. 9, 1975
B 313,594	3,924,626	Dec. 9, 1975
B 313,900	3,915,932	Oct. 28, 1975
B 314,049	3,920,588	Nov. 18, 1975
B 314,255	3,923,764	Dec. 2, 1975
B 314,271	3,921,845	Nov. 25, 1975
B 314,489	3,925,016	Dec. 9, 1975
B 314,977	3,923,459	Dec. 2, 1975
B 315,363	3,920,673	Nov. 18, 1975
B 315,397	3,923,963	Dec. 2, 1975
B 315,731	3,914,108	Oct. 21, 1975
B 316,014	3,920,861	Nov. 18, 1975
B 316,239	3,913,546	Oct. 21, 1975
B 316,917	3,925,494	Dec. 9, 1975
B 317,080	3,925,324	Dec. 9, 1975
B 317,347	3,923,552	Dec. 2, 1975
B 317,624	3,925,167	Dec. 9, 1975
B 318,195	3,915,699	Oct. 28, 1975
B 318,618	3,915,365	Oct. 28, 1975
B 318,640	3,925,186	Dec. 9, 1975
B 318,745	3,916,571	Nov. 4, 1975
B 319,226	3,925,082	Dec. 9, 1975
B 319,339	3,916,056	Oct. 28, 1975
B 319,402	3,919,568	Nov. 11, 1975
B 320,261	3,924,033	Dec. 2, 1975
B 320,452	3,925,083	Dec. 9, 1975
B 320,603	3,915,571	Oct. 28, 1975
B 321,018	3,921,623	Nov. 25, 1975
B 321,101	3,917,163	Nov. 4, 1975
B 321,938	3,923,889	Dec. 2, 1975
B 322,182	3,925,390	Dec. 9, 1975
B 322,239	3,920,973	Nov. 18, 1975
B 322,564	3,914,373	Oct. 21, 1975
B 322,611	3,920,863	Nov. 18, 1975
B 322,777	3,924,382	Dec. 9, 1975
B 323,127	3,923,967	Dec. 2, 1975
B 323,191	3,914,566	Oct. 21, 1975
B 323,203	3,916,165	Oct. 28, 1975
B 323,568	3,920,536	Nov. 18, 1975
B 323,666	3,924,568	Dec. 9, 1975
B 324,505	3,925,294	Dec. 9, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 324,739	3,924,990	Dec. 9, 1975	B 351,421	3,914,733	Oct. 21, 1975
B 324,879	3,923,538	Dec. 2, 1975	B 351,493	3,914,758	Oct. 21, 1975
B 325,102	3,924,355	Dec. 9, 1975	B 351,535	3,915,239	Oct. 28, 1975
B 325,262	3,921,304	Nov. 25, 1975	B 351,665	3,919,701	Nov. 11, 1975
B 326,514	3,925,080	Dec. 9, 1975	B 351,672	3,914,000	Oct. 21, 1975
B 327,109	3,925,350	Dec. 9, 1975	B 351,735	3,913,385	Oct. 21, 1975
B 327,363	3,923,504	Dec. 2, 1975	B 351,863	3,914,700	Oct. 21, 1975
B 327,612	3,925,620	Dec. 9, 1975	B 351,883	3,924,657	Dec. 9, 1975
B 327,674	3,918,540	Nov. 11, 1975	B 351,926	3,914,133	Oct. 21, 1975
B 327,899	3,925,674	Dec. 9, 1975	B 351,939	3,913,480	Oct. 21, 1975
B 328,164	3,914,703	Oct. 21, 1975	B 352,934	3,913,692	Oct. 21, 1975
B 328,200	3,916,031	Oct. 28, 1975	B 352,950	3,922,590	Nov. 25, 1975
B 328,205	3,914,106	Oct. 21, 1975	B 352,965	3,921,926	Nov. 25, 1975
B 328,210	3,914,275	Oct. 21, 1975	B 353,317	3,916,446	Nov. 4, 1975
B 328,870	3,916,486	Nov. 4, 1975	B 353,387	3,924,404	Dec. 9, 1975
B 329,115	3,924,727	Dec. 9, 1975	B 353,546	3,913,273	Oct. 21, 1975
B 329,476	3,920,562	Nov. 18, 1975	B 354,008	3,925,081	Dec. 9, 1975
B 329,612	3,925,128	Dec. 9, 1975	B 354,098	3,925,547	Dec. 9, 1975
B 329,787	3,920,688	Nov. 18, 1975	B 354,296	3,914,580	Oct. 21, 1975
B 329,816	3,923,947	Dec. 2, 1975	B 354,889	3,913,204	Oct. 21, 1975
B 330,536	3,925,452	Dec. 9, 1975	B 354,979	3,914,251	Oct. 21, 1975
B 330,828	3,913,589	Oct. 21, 1975	B 355,095	3,925,656	Dec. 9, 1975
B 331,417	3,914,157	Oct. 21, 1975	B 355,269	3,914,561	Oct. 21, 1975
B 331,557	3,916,577	Nov. 4, 1975	B 355,510	3,913,704	Oct. 21, 1975
B 331,895	3,916,403	Oct. 28, 1975	B 355,595	3,925,649	Dec. 9, 1975
B 332,527	3,924,017	Dec. 2, 1975	B 355,876	3,925,685	Dec. 9, 1975
B 332,811	3,924,359	Dec. 9, 1975	B 356,253	3,925,025	Dec. 9, 1975
B 333,876	3,921,208	Nov. 18, 1975	B 356,724	3,924,586	Dec. 9, 1975
B 334,251	3,924,719	Dec. 9, 1975	B 357,039	3,924,406	Dec. 9, 1975
B 334,868	3,919,469	Nov. 11, 1975	B 357,057	3,913,738	Oct. 21, 1975
B 334,985	3,923,912	Dec. 2, 1975	B 357,131	3,924,453	Dec. 9, 1975
B 335,741	3,925,615	Dec. 9, 1975	B 357,402	3,914,180	Oct. 21, 1975
B 335,773	3,920,953	Nov. 18, 1975	B 357,682	3,924,973	Dec. 9, 1975
B 336,129	3,923,606	Dec. 2, 1975	B 357,803	3,919,470	Nov. 11, 1975
B 336,243	3,925,422	Dec. 9, 1975	B 358,174	3,924,958	Dec. 9, 1975
B 336,345	3,925,179	Dec. 9, 1975	B 358,244	3,913,411	Oct. 21, 1975
B 336,652	3,914,211	Oct. 21, 1975	B 358,311	3,923,561	Dec. 2, 1975
B 336,902	3,918,897	Nov. 11, 1975	B 358,939	3,924,713	Dec. 9, 1975
B 336,946	3,919,425	Nov. 11, 1975	B 359,174	3,914,117	Oct. 21, 1975
B 336,978	3,923,968	Dec. 2, 1975	B 359,187	3,924,525	Dec. 9, 1975
B 337,235	3,919,386	Nov. 11, 1975	B 359,540	3,915,235	Oct. 28, 1975
B 337,409	3,925,258	Dec. 9, 1975	B 359,825	3,921,344	Nov. 25, 1975
B 337,442	3,913,658	Oct. 21, 1975	B 359,946	3,914,132	Oct. 21, 1975
B 337,703	3,914,690	Oct. 21, 1975	B 359,947	3,914,653	Oct. 21, 1975
B 337,787	3,923,506	Dec. 2, 1975	B 360,208	3,923,750	Dec. 2, 1975
B 339,057	3,924,822	Dec. 9, 1975	B 360,296	3,916,720	Nov. 4, 1975
B 339,218	3,925,121	Dec. 9, 1975	B 360,719	3,915,715	Oct. 28, 1975
B 340,212	3,922,645	Nov. 25, 1975	B 360,910	3,925,696	Dec. 9, 1975
B 340,833	3,925,208	Dec. 9, 1975	B 361,265	3,923,569	Dec. 2, 1975
B 341,579	3,913,363	Oct. 21, 1975	B 361,569	3,914,554	Oct. 21, 1975
B 342,423	3,925,334	Dec. 9, 1975	B 361,604	3,922,702	Nov. 25, 1975
B 342,886	3,923,507	Dec. 2, 1975	B 361,734	3,915,764	Oct. 28, 1975
B 343,136	3,919,453	Nov. 11, 1975	B 362,589	3,914,012	Oct. 21, 1975
B 343,240	3,925,693	Dec. 9, 1975	B 363,205	3,923,744	Dec. 2, 1975
B 343,506	3,916,021	Oct. 28, 1975	B 363,457	3,922,595	Nov. 25, 1975
B 343,577	3,921,165	Nov. 18, 1975	B 363,892	3,913,395	Oct. 21, 1975
B 344,479	3,924,042	Dec. 2, 1975	B 363,962	3,921,826	Nov. 25, 1975
B 345,060	3,916,018	Oct. 28, 1975	B 364,022	3,913,499	Oct. 21, 1975
B 345,384	3,916,146	Oct. 28, 1975	B 364,163	3,916,092	Oct. 28, 1975
B 345,422	3,914,392	Oct. 21, 1975	B 364,241	3,916,668	Nov. 4, 1975
B 345,567	3,913,985	Oct. 21, 1975	B 364,334	3,924,670	Dec. 9, 1975
B 346,165	3,913,293	Oct. 21, 1975	B 364,528	3,919,510	Nov. 11, 1975
B 346,210	3,916,142	Oct. 28, 1975	B 364,786	3,921,673	Nov. 25, 1975
B 346,350	3,915,824	Oct. 28, 1975	B 364,910	3,925,335	Dec. 9, 1975
B 346,585	3,913,820	Oct. 21, 1975	B 365,490	3,918,527	Nov. 11, 1975
B 346,613	3,923,545	Dec. 2, 1975	B 365,834	3,914,702	Oct. 21, 1975
B 346,901	3,915,583	Oct. 28, 1975	B 365,841	3,925,628	Dec. 9, 1975
B 348,083	3,923,774	Dec. 2, 1975	B 365,855	3,917,258	Nov. 4, 1975
B 348,383	3,923,452	Dec. 2, 1975	B 366,287	3,924,946	Dec. 9, 1975
B 348,495	3,914,654	Oct. 21, 1975	B 366,589	3,914,719	Oct. 21, 1975
B 348,558	3,914,109	Oct. 21, 1975	B 367,021	3,914,752	Oct. 21, 1975
B 349,141	3,915,363	Oct. 28, 1975	B 367,040	3,924,775	Dec. 9, 1975
B 349,177	3,914,033	Oct. 21, 1975	B 367,661	3,914,158	Oct. 21, 1975
B 349,231	3,915,831	Oct. 28, 1975	B 367,739	3,923,648	Dec. 2, 1975
B 349,321	3,916,103	Oct. 28, 1975	B 367,812	3,924,789	Dec. 9, 1975
B 349,948	3,914,557	Oct. 21, 1975	B 368,081	3,924,691	Dec. 9, 1975
B 350,143	3,924,419	Dec. 9, 1975	B 368,387	3,924,923	Dec. 9, 1975
B 350,219	3,917,802	Nov. 4, 1975	B 368,392	3,913,812	Oct. 21, 1975
B 350,245	3,914,331	Oct. 21, 1975	B 368,397	3,914,677	Oct. 21, 1975
B 350,523	3,924,726	Dec. 9, 1975	B 368,862	3,925,549	Dec. 9, 1975
B 350,708	3,923,871	Dec. 2, 1975	B 369,563	3,924,449	Dec. 9, 1975
B 350,843	3,915,461	Oct. 28, 1975	B 369,607	3,923,786	Dec. 2, 1975
B 351,055	3,914,074	Oct. 21, 1975	B 369,997	3,913,533	Oct. 21, 1975
B 351,218	3,914,186	Oct. 21, 1975	B 370,706	3,925,242	Dec. 9, 1975
B 351,222	3,921,179	Nov. 18, 1975	B 371,085	3,923,783	Dec. 2, 1975
B 351,348	3,923,563	Dec. 2, 1975	B 371,787	3,921,217	Nov. 18, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 371,805	3,914,433	Oct. 21, 1975	B 397,527	3,913,488	Oct. 21, 1975
B 371,836	3,923,541	Dec. 2, 1975	B 397,990	3,914,848	Oct. 28, 1975
B 372,823	3,924,660	Dec. 9, 1975	B 398,262	3,913,481	Oct. 21, 1975
B 373,297	3,924,436	Dec. 9, 1975	B 398,551	3,924,924	Dec. 9, 1975
B 373,326	3,920,433	Nov. 18, 1975	B 398,597	3,913,743	Oct. 21, 1975
B 373,428	3,915,511	Oct. 28, 1975	B 398,625	3,920,996	Nov. 18, 1975
B 375,220	3,920,417	Nov. 18, 1975	B 399,292	3,914,810	Oct. 28, 1975
B 375,652	3,921,303	Nov. 25, 1975	B 399,304	3,919,567	Nov. 11, 1975
B 376,504	3,914,570	Oct. 21, 1975	B 399,349	3,925,694	Dec. 9, 1975
B 376,654	3,922,513	Nov. 25, 1975	B 399,766	3,915,667	Oct. 28, 1975
B 376,742	3,924,392	Dec. 9, 1975	B 400,080	3,925,163	Dec. 9, 1975
B 376,799	3,913,955	Oct. 21, 1975	B 400,293	3,923,719	Dec. 2, 1975
B 377,172	3,918,255	Nov. 11, 1975	B 400,310	3,915,507	Oct. 28, 1975
B 377,683	3,924,433	Dec. 9, 1975	B 401,133	3,924,443	Dec. 9, 1975
B 377,833	3,913,884	Oct. 21, 1975	B 401,992	3,924,898	Dec. 9, 1975
B 377,869	3,917,002	Nov. 4, 1975	B 402,065	3,925,413	Dec. 9, 1975
B 378,621	3,923,840	Dec. 2, 1975	B 402,555	3,914,688	Oct. 21, 1975
B 379,038	3,923,994	Dec. 2, 1975	B 403,140	3,913,486	Oct. 21, 1975
B 379,172	3,914,379	Oct. 21, 1975	B 403,355	3,913,352	Oct. 21, 1975
B 379,282	3,913,462	Oct. 21, 1975	B 403,990	3,914,684	Oct. 21, 1975
B 379,955	3,913,157	Oct. 21, 1975	B 403,996	3,916,016	Oct. 28, 1975
B 380,014	3,921,915	Nov. 25, 1975	B 404,290	3,924,918	Dec. 9, 1975
B 380,141	3,925,161	Dec. 9, 1975	B 404,437	3,915,200	Oct. 28, 1975
B 380,310	3,921,048	Nov. 18, 1975	B 405,136	3,915,565	Oct. 28, 1975
B 380,312	3,913,953	Oct. 21, 1975	B 405,137	3,915,566	Oct. 28, 1975
B 380,338	3,924,873	Dec. 9, 1975	B 405,160	3,924,821	Dec. 9, 1975
B 380,446	3,923,836	Dec. 2, 1975	B 405,305	3,922,111	Nov. 25, 1975
B 380,900	3,913,307	Oct. 21, 1975	B 405,360	3,913,403	Oct. 21, 1975
B 380,926	3,925,095	Dec. 9, 1975	B 405,495	3,924,577	Dec. 9, 1975
B 381,074	3,919,583	Nov. 11, 1975	B 405,938	3,920,109	Nov. 18, 1975
B 381,632	3,914,732	Oct. 21, 1975	B 406,065	3,914,199	Oct. 21, 1975
B 381,847	3,921,152	Nov. 18, 1975	B 406,357	3,924,529	Dec. 9, 1975
B 382,021	3,913,212	Oct. 21, 1975	B 407,736	3,924,463	Dec. 9, 1975
B 382,261	3,914,991	Oct. 28, 1975	B 407,357	3,924,614	Dec. 9, 1975
B 382,290	3,924,717	Dec. 9, 1975	B 407,728	3,925,240	Dec. 9, 1975
B 382,783	3,919,527	Nov. 11, 1975	B 408,487	3,924,046	Dec. 2, 1975
B 382,798	3,924,435	Dec. 9, 1975	B 408,749	3,914,116	Oct. 21, 1975
B 382,840	3,922,007	Nov. 25, 1975	B 409,026	3,925,497	Dec. 9, 1975
B 383,532	3,914,246	Oct. 21, 1975	B 409,220	3,915,648	Oct. 28, 1975
B 383,581	3,925,318	Dec. 9, 1975	B 409,251	3,922,620	Nov. 25, 1975
B 384,499	3,925,135	Dec. 9, 1975	B 409,816	3,921,317	Nov. 25, 1975
B 384,658	3,913,452	Oct. 21, 1975	B 410,062	3,923,855	Dec. 2, 1975
B 384,773	3,915,416	Oct. 28, 1975	B 410,168	3,914,717	Oct. 21, 1975
B 385,210	3,913,406	Oct. 21, 1975	B 411,145	3,914,168	Oct. 21, 1975
B 386,403	3,924,895	Dec. 9, 1975	B 411,356	3,919,649	Nov. 11, 1975
B 386,592	3,925,305	Dec. 9, 1975	B 411,483	3,925,196	Dec. 9, 1975
B 387,039	3,924,510	Dec. 9, 1975	B 411,633	3,914,741	Oct. 21, 1975
B 387,331	3,913,701	Oct. 21, 1975	B 412,619	3,925,292	Dec. 9, 1975
B 387,687	3,918,151	Nov. 11, 1975	B 412,867	3,924,587	Dec. 9, 1975
B 387,761	3,914,245	Oct. 21, 1975	B 413,006	3,914,850	Oct. 28, 1975
B 387,790	3,925,380	Dec. 9, 1975	B 413,546	3,924,314	Dec. 9, 1975
B 387,818	3,918,935	Nov. 11, 1975	B 414,129	3,925,484	Dec. 9, 1975
B 388,580	3,923,712	Dec. 2, 1975	B 414,288	3,925,537	Dec. 9, 1975
B 389,070	3,914,171	Oct. 21, 1975	B 415,113	3,915,717	Oct. 28, 1975
B 389,285	3,914,631	Oct. 21, 1975	B 415,124	3,915,944	Oct. 28, 1975
B 389,327	3,924,504	Dec. 9, 1975	B 415,845	3,925,076	Dec. 9, 1975
B 389,639	3,914,626	Oct. 21, 1975	B 415,847	3,914,208	Oct. 21, 1975
B 389,726	3,921,010	Nov. 18, 1975	B 415,957	3,925,635	Dec. 9, 1975
B 389,807	3,922,623	Nov. 25, 1975	B 416,598	3,923,473	Dec. 2, 1975
B 389,932	3,913,268	Oct. 21, 1975	B 416,832	3,924,975	Dec. 9, 1975
B 389,933	3,913,267	Oct. 21, 1975	B 416,710	3,923,746	Dec. 2, 1975
B 390,679	3,913,668	Oct. 21, 1975	B 416,933	3,924,968	Dec. 9, 1975
B 390,732	3,913,878	Oct. 21, 1975	B 417,299	3,918,235	Nov. 11, 1975
B 391,184	3,914,214	Oct. 21, 1975	B 418,121	3,925,023	Dec. 9, 1975
B 391,210	3,914,220	Oct. 21, 1975	B 418,153	3,925,251	Dec. 9, 1975
B 391,437	3,915,416	Oct. 28, 1975	B 418,302	3,913,252	Oct. 21, 1975
B 391,509	3,925,175	Dec. 9, 1975	B 419,327	3,921,197	Nov. 18, 1975
B 391,675	3,916,017	Oct. 28, 1975	B 419,481	3,924,970	Dec. 9, 1975
B 392,154	3,923,809	Dec. 2, 1975	B 420,016	3,914,572	Oct. 21, 1975
B 392,696	3,916,175	Oct. 28, 1975	B 420,514	3,923,929	Dec. 2, 1975
B 392,732	3,914,903	Oct. 21, 1975	B 420,568	3,925,069	Dec. 9, 1975
B 392,753	3,916,341	Oct. 28, 1975	B 421,026	3,914,785	Oct. 21, 1975
B 392,894	3,914,763	Oct. 21, 1975	B 421,362	3,924,817	Dec. 9, 1975
B 393,163	3,914,535	Oct. 21, 1975	B 421,383	3,925,047	Dec. 9, 1975
B 393,970	3,914,638	Oct. 21, 1975	B 421,797	3,914,023	Oct. 21, 1975
B 394,088	3,914,740	Oct. 21, 1975	B 422,467	3,924,804	Dec. 9, 1975
B 394,188	3,924,591	Dec. 9, 1975	B 422,949	3,921,873	Nov. 25, 1975
B 394,300	3,914,159	Oct. 21, 1975	B 424,415	3,919,458	Nov. 11, 1975
B 394,712	3,916,306	Oct. 28, 1975	B 424,462	3,920,522	Nov. 18, 1975
B 395,478	3,922,577	Nov. 25, 1975	B 424,572	3,924,979	Dec. 9, 1975
B 395,496	3,919,435	Nov. 11, 1975	B 424,748	3,924,395	Dec. 9, 1975
B 395,671	3,920,418	Nov. 18, 1975	B 425,035	3,914,025	Oct. 21, 1975
B 395,889	3,913,190	Oct. 21, 1975	B 425,345	3,922,015	Nov. 25, 1975
B 396,025	3,913,869	Oct. 21, 1975	B 425,470	3,923,796	Dec. 2, 1975
B 396,551	3,921,929	Nov. 25, 1975	B 425,539	3,916,742	Nov. 4, 1975
B 397,027	3,923,736	Dec. 2, 1975	B 425,541	3,914,051	Oct. 21, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 425,572	3,923,822	Dec. 2, 1975	B 439,669	3,921,499	Nov. 25, 1975
B 427,631	3,921,433	Nov. 25, 1975	B 440,898	3,921,789	Nov. 25, 1975
B 428,177	3,914,624	Oct. 21, 1975	B 441,024	3,913,629	Oct. 21, 1975
B 428,795	3,921,056	Nov. 18, 1975	B 441,416	3,913,851	Oct. 21, 1975
B 429,442	3,923,485	Dec. 2, 1975	B 442,280	3,914,054	Oct. 21, 1975
B 430,106	3,918,941	Nov. 11, 1975	B 442,859	3,918,570	Nov. 11, 1975
B 430,140	3,922,084	Nov. 25, 1975	B 442,919	3,925,483	Dec. 9, 1975
B 430,798	3,918,204	Nov. 11, 1975	B 445,471	3,914,711	Oct. 21, 1975
B 430,944	3,922,096	Nov. 25, 1975	B 445,740	3,923,612	Dec. 2, 1975
B 432,373	3,919,670	Nov. 11, 1975	B 448,571	3,924,760	Dec. 9, 1975
B 433,587	3,914,567	Oct. 21, 1975	B 449,647	3,916,797	Nov. 4, 1975
B 435,343	3,919,244	Nov. 11, 1975	B 450,499	3,920,526	Nov. 18, 1975
B 435,844	3,925,170	Dec. 9, 1975	B 450,546	3,924,417	Dec. 9, 1975
B 437,173	3,924,627	Dec. 9, 1975	B 450,927	3,913,844	Oct. 21, 1975
B 437,172	3,913,251	Oct. 21, 1975	B 455,520	3,922,543	Nov. 25, 1975
B 437,195	3,914,618	Oct. 21, 1975	B 455,775	3,914,356	Oct. 21, 1975
B 437,450	3,922,479	Nov. 25, 1975	B 456,346	3,914,531	Oct. 21, 1975
B 438,053	3,916,013	Oct. 28, 1975	B 461,872	3,919,586	Nov. 11, 1975
B 438,706	3,925,050	Dec. 9, 1975	B 467,684	3,915,119	Oct. 28, 1975
B 439,168	3,919,676	Nov. 11, 1975	B 468,198	3,925,340	Dec. 9, 1975

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 9TH DAY OF DECEMBER, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aoki, Koichi; Yano, Seinosuke; Mimura, Hiroshi; Inoue, Tohru; and Sakurai, Hiroshi, to Nippon Steel Corporation. Method of heat-treating low temperature tough steel. Re. 28,645, Cl. 148-12.00F.

Baker Oil Tools, Inc.: *See*—
Chenoweth, David V., Re. 28,641.

Bethlehem Steel Corporation: *See*—
Horton, James B.; and Townsend, Herbert E., Jr., Re. 28,644.

Blum, Harry P., to Blumcraft of Pittsburgh. Ornamental railing. Re. 28,643, Cl. 256-24.000.

Blumcraft of Pittsburgh: *See*—
Blum, Harry P., Re. 28,643.

Chenoweth, David V., to Baker Oil Tools, Inc. Retrievable subsurface well tools. Re. 28,641, Cl. 166-120.000.

Crocker, Thomas H., to Kawneer Company, Inc. Automatic door operator. Re. 28,639, Cl. 49-264.000.

Davis, Paul H., to Dukane Corporation. Ultrasonic rigid horn assembly. Re. 28,642, Cl. 228-1.000.

Dukane Corporation: *See*—
Davis, Paul H., Re. 28,642.

Hedrick, Ross Melvin; and Richard, William R., Jr., to Monsanto Company. Reinforced polyamides and process of preparation thereof. Re. 28,646, Cl. 260-37.00N.

Horton, James B.; and Townsend, Herbert E., Jr., to Bethlehem Steel Corporation. Method and means for corrosion protection of cables exposed to underground environments. Re. 28,644, Cl. 21-2.50R.

Inoue, Tohru: *See*—
Aoki, Koichi; Yano, Seinosuke; Mimura, Hiroshi; Inoue, Tohru; and Sakurai, Hiroshi, Re. 28,645.

Intercontinental Plastics Manufacturing: *See*—
Sauriol, John T., Re. 28,640.

Kawneer Company, Inc.: *See*—
Crocker, Thomas H., Re. 28,639.

Mimura, Hiroshi: *See*—
Aoki, Koichi; Yano, Seinosuke; Mimura, Hiroshi; Inoue, Tohru; and Sakurai, Hiroshi, Re. 28,645.

Monsanto Company: *See*—
Hedrick, Ross Melvin; and Richard, William R., Jr., Re. 28,646.

Nippon Steel Corporation: *See*—
Aoki, Koichi; Yano, Seinosuke; Mimura, Hiroshi; Inoue, Tohru; and Sakurai, Hiroshi, Re. 28,645.

Richard, William R., Jr.: *See*—
Hedrick, Ross Melvin; and Richard, William R., Jr., Re. 28,646.

Sakurai, Hiroshi: *See*—
Aoki, Koichi; Yano, Seinosuke; Mimura, Hiroshi; Inoue, Tohru; and Sakurai, Hiroshi, Re. 28,645.

Sauriol, John T., to Intercontinental Plastics Manufacturing. Meter housing. Re. 28,640, Cl. 52-19.000.

Slinko, Mikhail Gavrilovitch, to UCB Societe Anonyme, a part interest. Process for carrying out chemical reactions in a fluidized bed. Re. 28,648, Cl. 260-465.300.

Townsend, Herbert E., Jr.: *See*—
Horton, James B.; and Townsend, Herbert E., Jr., Re. 28,644.

Tsuchiya, Tsutomu: *See*—
Umezawa, Sumio; Umezawa, Hamao; and Tsuchiya, Tsutomu, Re. 28,647.

UCB Societe Anonyme: *See*—
Slinko, Mikhail Gavrilovitch, Re. 28,648.

Umezawa, Hamao: *See*—
Umezawa, Sumio; Umezawa, Hamao; and Tsuchiya, Tsutomu, Re. 28,647.

Umezawa, Sumio; Umezawa, Hamao; and Tsuchiya, Tsutomu, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Preparation of 3-4 dideoxykanamycin B active against resistant bacteria. Re. 28,647, Cl. 260-210.00K.

Yano, Seinosuke: *See*—
Aoki, Koichi; Yano, Seinosuke; Mimura, Hiroshi; Inoue, Tohru; and Sakurai, Hiroshi, Re. 28,645.

Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See*—
Umezawa, Sumio; Umezawa, Hamao; and Tsuchiya, Tsutomu, Re. 28,647.

LIST OF PLANT PATENTEES

Olson, Christian. Strawberry plant. 3,814, 12–9–75, Cl. 49.

LIST OF DESIGN PATENTEES

Airborne, S.A.: *See*—
Bernard, Charles. 237,920.

Alemagna S.p.A.: *See*—
Alemagna, Alberto. 237,943.

Alemagna, Alberto, to Alemagna S.p.A. Dispensing container for granulated material. 237,943, 12–9–75, Cl. D9—63.

American Home Products Corp.: *See*—
Welker, George W., III., and Brady. 237,942.

Anderson, Granville W. Trousers. 237,914, 12–9–75, Cl. D2—28.

Anderson, Roy A. Nozzle for an ear syringe or the like. 238,006, 12–9–75, Cl. D83—1.

Backstrom, Olof F., and E. O. Linden, to Oy Fiskars AB. Kitchen scissors. 237,937, 12–9–75, Cl. D8—57.

Baresel-Bofinger, Rudolf: *See*—
Mleinik, Burkhard. 237,916.

Bell & Howell Co.: *See*—
Gross, Roger A. 238,002.

Bernard, Charles, to Airborne, S.A. Chair. 237,920, 12–9–75, Cl. D6—56.

Billeter, Henry R. Combination flush valve and bedpan rinsing apparatus. 237,967, 12–9–75, Cl. D23—38.

Bluestein, Bernard B., and N. A. Steinkamp, to Sunbeam Corp. Hand held detangler. 238,008, 12–9–75, Cl. D86—8.

Bonifant, Bern M. Fan for internal combustion engines. 237,972, 12–9–75, Cl. D23—165.

Boyd, Gordon R.: *See*—
Taylor, Herbert J., and Boyd. 237,949.

Brady, Joseph E.: *See*—
Welker, George W., III., and Brady. 237,942.

Brandenfels, Carl. Kitchen island table. 237,931, 12–9–75, Cl. D6—199.

Broadbent, Lynn C., and W. B. Thomas. Root cellar. 237,963, 12–9–75, Cl. D13—1.

Burke, Frederick A.: *See*—
Long, Douglas A., and Burke. 238,009.

Byerly, Robert N., to Congoleum Industries, Inc. Soft surface floor covering or similar article. 238,013, 12–9–75, Cl. D92—4.

Canton, Joaquin J. Carrying case. 238,011, 12–9–75, Cl. D87—1.

Chapin, Richard M., and H. T. Haynes, to Paoli Chair Co., Inc. Rocking chair. 237,918, 12–9–75, Cl. D6—49.

Choponis, Roger J. Ice fishing shanty. 237,964, 12–9–75, Cl. D13—1.

Chiang, Yang-K Un. Range hood. 237,971, 12–9–75, Cl. D23—151.

Cibie, Pierre, to Cibie Projecteurs. Motor vehicle headlight. 237,998, 12–9–75, Cl. D48—32.

Cibie Projecteurs: *See*—
Cibie, Pierre. 237,998.

Clugston, George D. Cattle feeder. 237,980, 12–9–75, Cl. D30—13.

Coca-Cola Co., The: *See*—
Taylor, Harvey C., Godden, and Barrash. 237,944.

Colgate-Palmolive Co.: *See*—
Thomas, Tedd T. 237,925.

Conde, Hector O., and J. G. Vidal, to Electronic Protection Systems. Grip locator for a tennis racquet. 237,988, 12–9–75, Cl. D34—5.

Congoleum Industries, Inc.: *See*—
Byerly, Robert N. 238,013.
Nugent, Philip. 238,014.
Nugent, Philip. 238,015.

C'stellini, Joyce R.: *See*—
Huseman, Nancy M., C'stellini, and Feldkamp. 238,012.

Dart Industries, Inc.: *See*—
Laylon, Harry. 237,929.

Davis, John D., to Loma Corp. Garden plant identification stake. 237,994, 12–9–75, Cl. D35—1.

Davis, Carl B.: *See*—
Seufert, George E., and Davis. 237,953.
Seufert, George E., and Davis. 237,955.

DeBrey, Robert J. Battery charger. 237,979, 12–9–75, Cl. D26—15.
Demmer, Darwin L. Child's workbench. 237,930, 12–9–75, Cl. D6—179.
Dotter, William F. Golf cart umbrella mount. 237,941, 12–9–75, Cl. D8—235.
Draik Midwest Co., Inc.: *See*—
Kent, Eugene R. 237,928.
Dunchock, Richard S., to Optarac Corp. Eyeglass display support post. 237,932, 12–9–75, Cl. D6—191.
Electronic Protection Systems: *See*—
Conde, Hector O., and Vidal. 237,988.
England, Will C. Roller board. 237,989, 12–9–75, Cl. D34—5.
Fairthorne, Victor L., to Westinghouse Canada Ltd. Electric tea kettle. 237,934, 12–9–75, Cl. D7—62.
Famolare, Joseph P., Jr., to Famolare, Inc. Clog roller skate. 237,991, 12–9–75, Cl. D34—14.
Famolare, Joseph P., Jr., to Famolare, Inc. Sandal roller skate 237,992, 12–9–75, Cl. D34—14.
Famolare, Inc.: *See*—
Famolare, Joseph P., Jr. 237,991.
Famolare, Joseph P., Jr. 237,992.
Farley, Oliver. Mirror or picture frame. 237,933, 12–9–75, Cl. D6—244.
Fiber Classics, Ltd.: *See*—
Gore, Bobby J. 237,958.
Firdmann, Jacques. Toilet seat. 237,969, 12–9–75, Cl. D23—71.
Futorian Corp.: *See*—
Winow, Thomas. 237,923.
Friedman, Aaron I. Display rack. 237,924, 12–9–75, Cl. D6—85.
Gabriel Industries, Inc.: *See*—
Stubbmann, Albert. 237,985.
Gavere, Harold K.: *See*—
Nowicki, John V., and Gavere. 237,948.
Geraci, James L., to Xomox Corp. Post auricular pressure dressing. 238,007, 12–9–75, Cl. D83—1.
Gillespie, Monte C., and D. L. Kerkenbush, to South Bend Toy Mfg. Co., Inc. Tennis racquet. 237,990, 12–9–75, Cl. D34—5.
Godden, Michael W. J.: *See*—
Taylor, Harvey C., Godden, and Barrash. 237,944.
Gore, Bobby J., to Fiber Classics, Ltd. Horse trailer body. 237,958, 12–9–75, Cl. D12—105.
Gross, Roger A., to Bell & Howell Co. Aperture card reader. 238,002, 12–9–75, Cl. D61—1.
Haffner, Donald G.: *See*—
Meyer, Dean A., Haffner, Hoffmeyer, and Lazzeroni, Sr. 237,995.
Hall, Frank K., and R. D. Moore. Housing for an aquarium immersion heater. 237,970, 12–9–75, Cl. D23—87.
Hartwein, Peter. Tape recorder or similar article. 237,978. 12–9–75, Cl. D26—14.
Haynes, Hamlin T.: *See*—
Chapin, Richard M., and Haynes. 237,919.
Hoagland, Peter S. Drafting instrument. 237,950, 12–9–75, Cl. D10—62.
Holmquist, Arne E, to Lindaco Ltd. Sheet collator. 238,004, 12–9–75, Cl. D64—11.
Hoogesteger, Paul A. Miniaturized spectrophotometer. 237,982, 12–9–75, Cl. D32—2.
Huseman, Nancy M., J. R. C'stellini, and J. M. Feldkamp. Handbag. 238,012, 12–9–75, Cl. D87—3.
Isaacs, Robert B. Housing for electronic console. 237,977, 12–9–75, Cl. D26—5.
Jacks, Hazel. Paperweight or similar article. 238,005, 12–9–75, Cl. D19—97.
Jacobsen Mfg. Co.: *See*—
Meyer, Dean A., Haffner, Hoffmeyer, and Lazzeroni, Sr. 237,995.
Jepson, John W.: *See*—
Lynch, Francis D., Jepson, and Brown. 237,983.
Joseph A. Kaplan & Sons, Inc.: *See*—
Katzander, Barbara A. 237,926.
Kaplan, Burton H., to Rowe Furniture Corp. Furnishing element. 237,921, 12–9–75, Cl. D6—63.
Kato, Katsuichi: *See*—
Naito, Hiroshi, and Kato. 237,956.
Katzander, Barbara A., to Joseph A. Kaplan & Sons, Inc. Combined soap dish, toothbrush holder, and tumbler. 237,926, 12–9–75, Cl. D6—91.
Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Naito, Hiroshi, and Kato. 237,956.
Kent, Eugene R., to Draik Midwest Co., Inc. Shop desk or similar articles. 237,928, 12–9–75, Cl. D6—162.
Kerkenbush, Darle L.: *See*—
Gillespie, Monte C., and Kerkenbush. 237,990.
King, Donald G. Book holder and support for telephone directories and the like. 237,927, 12–9–75, Cl. D6—114.
Kohner, Inc.: *See*—
Stubbmann, Albert. 237,986.
Kojima, Shizuka, to Tomy Kogyo Co., Inc. Toy racing trackway. 237,984, 12–9–75, Cl. D34—5.
Laylon, Harry, to Dart Industries, Inc. Dining table or the like. 237,929, 12–9–75, Cl. D6—175.
Lindaco Ltd.: *See*—
Holmquist, Arne E. 238,004.
Linden, Erkki O.: *See*—
Backstrom, Olof F., and Linden. 237,937.
Loma Corp.: *See*—
Davis, John D. 237,994.
Long, Douglas A., and F. A. Burke. Hair dryer. 238,009, 12–9–75, Cl. D86—10.
Lynch, Francis D., J. W. Jepson, and R. A. Brown. Golf ball. 237,983. 12–9–75, Cl. D34—5.
Market Achievement Programs, Inc.: *See*—
Seufert, George E., and Davis. 237,953.
Seufert, George E., and Davis. 237,955
Mastrell, Carl E. Combined container and test cup intended for bacteriological preparations and bacteriological tests. 237,981, 12–9–75, Cl. D32—1.
McNair, Samuel L. Massage spray head. 237,966, 12–9–75, Cl. D23—35.
Metzner, Robert S.: *See*—
Wolfe, William L., Metzner, and Zimmerman. 238,003.
Meyer, Dean A., D. G. Haffner, K. H. Hoffmeyer, and E. J. Lazzeroni, Sr., to Jacobsen Mfg. Co. Lawn and garden tractor. 237,995, 12–9–75, Cl. D4—5.
Minnesota Mining & Mfg. Co.: *See*—
Nowicki, John V., and Gavere. 237,948.
Mleinik, Burkhard, to Rudolf Baresel-Bofinger. Collapsible chair. 237,916, 9–12–75, Cl. D6—37.
Molenaar, Lester V. Display stand. 237,915, 12–9–75, Cl. D6—23.
Mondragon, Ralph. Spindle for use in doors, panels or the like. 237,962, 12–9–75, Cl. D13—1.
Moore, Ronald D.: *See*—
Hall, Frank K., and Moore. 237,970.
Motorola, Inc.: *See*—
Trayes, T. John. 237,940.
Nakada, Masakatsu. Bell. 237,952, 12–9–75, Cl. D10—116.
Naito, Hiroshi, and K. Kato, to Kawasaki Jukogyo Kabushiki Kaisha. Water scooter. 237,956, 12–9–75, Cl. D12—69.
Northland Aluminum Products, Inc.: *See*—
Nygren, Donald W. 237,935.
Nowicki, John V., and H. K. Gavere, to Minnesota Mining & Mfg. Co. Repairing and splicing kit container. 237,948, 12–9–75, Cl. D9—174.
Nugent, Philip, to Congoleum Industries, Inc. Soft surface floor covering or similar article. 238,014, 12–9–75, Cl. D92—4.
Nugent, Philip, to Congoleum Industries, Inc. Soft surface floor covering or similar article. 238,015, 12–9–75, Cl. D94—4.
Nygren, Donald W., to Northland Aluminum Products, Inc. Waffle iron. 237,935, 12–9–75, Cl. D7—88.
Olson, John W., *et al.* Thumbscrew valve depressor. 237,968, 12–9–75, Cl. D23—40.
Optarac Corp.: *See*—
Dunchock, Richard S. 237,932.
Owens-Illinois, Inc.: *See*—
Strand, Gordon A. 237,945.
Owens-Corning Fiberglas Corp.: *See*—
Seymour, Merritt W. 237,917.
Oy Fiskars AB: *See*—
Backstrom, Olof F., and Linden. 237,937.
Paoli Chair Co., Inc.: *See*—
Chapin, Richard M., and Haynes. 237,918.
Chapin, Richard M., and Haynes. 237,919.
Pardo, John, to The Procter & Gamble Co. A combined bottle and cap therefor. 237,946, 12–9–75, Cl. D9—128.
Patla, Jacob W., to Xerox Corp. Bookbinding machine. 238,000, 12–9–75, Cl. D55—1.
Pawsat, Carlton P., to Wald Mfg. Co., Inc. Bicycle steering post. 237,959, 12–9–75, Cl. D12—118.
Pedersen, Henry C. Chair. 237,922, 12–9–75, Cl. D6—68.
Petty, Preston L. Motorcycle fender. 237,961, 12–9–75, Cl. D12—186.
Pierre, Bernard J., to Poclain. Cab for earth moving and handling machinery or the like. 237,996, 12–9–75, Cl. D40—5.
Poclain: *See*—
Pierre, Bernard J. 237,996.
Poulin, Eugene A. Ring or similar article. 237,997, 12–9–75, Cl. D45—10.
Procter & Gamble Co., The: *See*—
Pardo, John. 237,946.
Rellis, Lawrence B. Aircraft. 237,957, 12–9–75, Cl. D12—78.
Risdon Mfg. Co., The: *See*—
Wakeman, Alfred W. 237,936.
Rowe Furniture Corp.: *See*—
Kaplan, Burton H. 237,921.
Royal Industries: *See*—
Runyon, Richard C. 237,999.
Runyon, Richard C., to Royal Industries. Warning device for emergency vehicles or the like. 237,999, 12–9–75, Cl. D48—32.
SCM Corp.: *See*—
Wolfe, William L., Metzner, and Zimmerman. 238,003.
Schlesch, Ronald D. Steam trap. 237,965, 12–9–75, Cl. D23—1.
Seminario, Ezekiel. Valve core extraction tool. 237,939, 12–D8—59.
Seminario, Ezekiel. Valve core extraction tool. 237,938, 12–9–75, Cl. D8—59.
Seufert, George E., and C. B. Davis, to Market Achievement Programs, Inc. Utility cleaning cart. 237,953, 12–9–75, Cl. D12—29.
Seufert, George E., and C. B. Davis, to Market Achievement Programs, Inc. Utility cleaning cart. 237,954, 12–9–75, Cl. D12—29.
Seufert, George E., and C. B. Davis, to Market Achievement Programs, Inc. Utility cleaning cart. 237,955, 12–9–75, Cl. D12—29.
Seymour, Merritt W., to Owens-Corning Fiberglas Corp. Wall mounted seat. 237,917. 12–9–75, Cl. D6—47.
Simeri, R. A. Anemometer. 237,951, 12–9–75, Cl. D10—96.
South Bend Toy Co., Inc.: *See*—
Gillespie, Monte C., and Kerkenbush. 237,990.
Steinkamp, Norman A.: *See*—
Bluestein, Bernard B., and Steinkamp. 238,008.
Stern, Ralph. Combination battery holder and battery. 237,973, 12–9–75, Cl. D26—4.
Strand, Gordon A., to Owens-Illinois, Inc. Bottle. 237,945, 12–9–75, Cl. D9—127.
Stubbmann, Albert, to Gabriel Industries, Inc. Die game board. 237,985, 12–9–75, Cl. D34—5.
Stubbmann, Albert, to Kohner, Inc. Gameboard. 237,986, 12–9–75, Cl. D34—55.

Stubbmann, Albert, to Kohner, Inc. Gameboard. 237,987, 12–9–75, Cl. D34—55.
Sunbeam Corp. : *See*—
Bluestein, Bernard B., and Steinkamp. 238,008.
Sunne Controls Division of Peco Mfg. Co. : *See*—
Taylor, Herbert J., and Boyd. 237,949.
Takahashi, Osamu, to Tomy Kogyo Co., Inc. Toy health center. 237,993, 12–9–75, Cl. D34—15.
Taylor, Harvey C., M. W. J. Godden, and M. J. Barrash, to The Coca-Cola Co. Bottle. 237,944, 12–9–75, Cl. D9—100.
Taylor, Herbert J., and G. R. Boyd, to Sunne Controls Division of Peco Mfg. Co. Room thermostat with concealed control. 237,949, 12–9–75, Cl. D10—50.
Thomas, Tedd T., to Colgate-Palmolive Co. Combined soap bar container and cover therefor. 237,925, 12–9–75, Cl. D6—89.
Thomas, William B. : *See*—
Broadbent, Lynn C., and Thomas. 237,963.
Tomy Kogyo Co., Inc. : *See*—
Kojima, Shizuka. 237,984.
Takahashi, Osamu. 237,993.
Trayes, T. John, to Motorola, Inc. Vacuum pick-up for wafers. 237,940, 12–9–75, Cl. D8—71.
Vedder, Gene D. Combination perforator and perforated tape reader. 237,974, 12–9–75, Cl. D26—5.
Vedder, Gene D. Combination perforator and perforated tape reader. 237,975, 12–9–75, Cl. D26—5.
Vidal, Jise G. : *See*—
Conde, Hector O., and Vidal. 237,988.
Wakeman, Alfred W., to The Risdon Mfg. Co. Scissors. 237,936, 12–9–75, Cl. D8—57.
Wald Mfg. Co., Inc. : *See*—
Pawsat, Carlton P. 237,959.
Welker, George W., III., and J. E. Brady, to American Home Products Corp. Dispensing containeer. 237,942, 12–9–75, Cl. D9—2.
Westinghouse Canada Ltd. : *See*—
Fairthorne, Victor L. 237,934.
Whitehead, Robert J. Automobile hood. 237,960, 12–9–75, Cl. D12—173.
Winrow, Thomas, to Futorian Corp. Seat. 237,923, 12–9–75, Cl. D6—73.
Wohlman, Frederick, Jr. Sorter for electrical component testing apparatus. 238,001, 12–9–75, Cl. D55—1.
Wolfe, William L., R. S. Metzner, and R. C. Zimmerman, to SCM Corp. Printer unit. 238,003, 12–9–75, Cl. D64—11.
Wolfe, William L., R. C. Zimmerman, and G. M. Adams, Keyboard and display unit. 237,976, 12–9–75, Cl. D26—5.
Xerox Corp. : *See*—
Patla, Jacob W. 238,000.
Xomox Corp. : *See*—
Geraci, James L. 238,007.
Zimmerman, Robert C. : *See*—
Wolfe, William L., Zimmerman, and Adams. 237,976.

CLASSIFICATION OF PATENTS

ISSUED DECEMBER 9, 1975

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2
14D 3,924,271
16 3,924,272
69.5 3,924,273

CLASS 3
1.91 3,924,274
3,924,276
1.911 3,924,277
1.912 3,924,275

CLASS 4
176 3,924,278
252R 3,924,279

CLASS 5
81R 3,924,281
98R 3,924,280
327R 3,924,282
338 3,924,283
347 3,924,284

CLASS 8
4 3,925,006
91 3,925,007
111 3,925,008
115.7 3,925,009
142 3,925,010
168 3,925,015
169 3,925,011
3,925,012
3,925,016
173 3,925,013

CLASS 15
49R 3,924,285
114 3,924,286
192 3,924,287
225 3,924,288
229AC 3,924,289
250.04 3,924,290
330 3,924,291

CLASS 16
35D 3,924,292
169 3,924,293
174 3,924,294

CLASS 17
32 3,924,295
45 3,924,296

CLASS 19
255 3,924,297

CLASS 21
2.5R Re.28,644
105 3,925,014

CLASS 23
230B 3,925,017
3,925,020
230R 3,925,018
3,925,019
252R 3,925,021
254EF 3,925,023
254E 3,925,022
277R 3,925,024
288FC 3,925,026
288G 3,925,025
296 3,925,027
298 3,925,028

CLASS 24
16PB 3,924,298
3,924,299
31L 3,924,301
74A 3,924,302
137R 3,924,303
163K 3,924,304
205.1R 3,924,305
205.14R 3,924,306
243P 3,924,307
274R 3,924,308

CLASS 27
2 3,924,309

CLASS 28
1.6 3,924,310
72.11 3,924,311

CLASS 29
25.35 3,924,312
121R 3,924,313
156.4R 3,924,314
200D 3,924,315
202R 3,924,316
509 3,924,317
567 3,924,318
578 3,924,319
3,924,320
580 3,924,321
3,924,322
583 3,924,323
592 3,924,324
626 3,924,325

CLASS 30
120.2 3,924,326
277 3,924,327
307 3,924,328
339 3,924,329
362 3,924,330
366 3,924,331

CLASS 32
14R 3,924,332
33 3,924,333
57 3,924,334
58 3,924,335

CLASS 33
164R 3,924,336
169R 3,924,337
174TC 3,924,338

CLASS 35
8B 3,924,340
8R 3,924,339
10.4 3,924,341
12N 3,924,342

CLASS 38
102.1 3,924,343

CLASS 40
129C 3,924,344

CLASS 43
21.2 3,924,345
26.2 3,924,346
90 3,924,347

CLASS 44
7.5 3,925,029
56 3,925,030
3,925,031
62 3,925,032

CLASS 46
17 3,924,348
3,924,349
92 3,924,350
118 3,924,351
202 3,924,352

CLASS 47
1 3,924,353
34.11 3,924,354

CLASS 48
144 3,925,033

CLASS 49
264 Re.28,639

CLASS 51
2 3,924,355
7 3,924,356
13 3,924,357
34C 3,924,358
103TF 3,924,359
221BS 3,924,360
283 3,924,361
296 3,925,034
309 3,925,035
358 3,924,362

CLASS 52
2 3,924,363
3,924,364
19 Re.28,640
63 3,924,365
69 3,924,366
80 3,924,367
86 3,924,368
122 3,924,369
126 3,924,370
161 3,924,371
213 3,924,373
232 3,924,372
243 3,924,374
593 3,924,376
620 3,924,377
637 3,924,379
664 3,924,380
758D 3,924,378

CLASS 53
3 3,924,381
7 3,924,382
14 3,924,383
38 3,924,384
48 3,924,385
60 3,924,386
291 3,924,387
380 3,924,375

CLASS 54
80 3,924,388

CLASS 55
158 3,925,036
3,925,037
159 3,925,038
223 3,925,039
257 3,925,040
267 3,925,041
269 3,925,042
276 3,925,043
337 3,925,044
345 3,925,045
387 3,925,046

CLASS 56
10.2 3,924,389
328TS 3,924,390
364 3,924,391

CLASS 57
34R 3,924,392
3,924,393
3,924,394
34.5 3,924,395
35 3,924,396
56 3,924,397
58.89 3,924,398

CLASS 58
16D 3,924,399
50R 3,924,400
152R 3,924,401

CLASS 60
39.18C 3,924,402
39.32 3,924,403
219 3,924,405
226R 3,924,404
254 3,924,406
284 3,924,407
290 3,924,408
3,924,409
403 3,924,410
486 3,924,411

CLASS 61
1F 3,924,412
53 3,924,413
3,924,414
72.3 3,924,415

CLASS 62
20 3,925,047
55 3,925,048
80 3,924,416
158 3,924,417

CLASS 63
4 3,924,418

CLASS 64
14 3,924,419
21 3,924,420
29 3,924,421

CLASS 65
3,925,049
60 3,925,050
65A 3,925,051
3,925,052

CLASS 66
43 3,924,423

CLASS 68
177 3,924,424
242 3,924,425

CLASS 70
18 3,924,426
264 3,924,427

CLASS 71
29 3,925,053
92 3,925,054
93 3,925,055
98 3,925,056

CLASS 72
40 3,924,428
60 3,924,429
85 3,924,430
98 3,924,431
122 3,924,433
123 3,924,432
208 3,924,434
209 3,924,435
342 3,924,439
345 3,924,436
349 3,924,437
388 3,924,438
397 3,924,440
475 3,924,441

CLASS 73
1B 3,924,443
1R 3,924,442
3,924,444
3 3,924,445
37 3,924,446
54 3,924,447
55 3,924,448
61.1R 3,924,449
67 3,924,450
67.2 3,924,451
67.8R 3,924,454
67.8S 3,924,452
3,924,453
88R 3,924,456
88 3,924,455
116 3,924,457
133R 3,924,458
136R 3,924,459
146 3,924,460
3,924,461
150R 3,924,462
155 3,924,463
170R 3,924,464
181 3,924,465
194EM 3,924,466
213 3,924,467
343R 3,924,468
355EM 3,924,469
362AR 3,924,470
421B 3,924,471
426 3,924,472
471 3,924,473
505 3,924,474

CLASS 74
5.6A 3,924,475
30 3,924,476
44 3,924,477
63 3,924,478
89.16 3,924,479
230.17A 3,924,480
231C 3,924,481
234 3,924,482
242.11R 3,924,483
242.4 3,924,833
331 3,924,484
410 3,924,485
459 3,924,486
489 3,924,487
568R 3,924,488
688 3,924,489
752E 3,924,490
763 3,924,491

CLASS 75
1T 3,925,057
1 3,925,058
3 3,925,069
10R 3,925,059
11 3,925,060
58 3,925,061
84 3,925,062
124 3,925,063
128A 3,925,064
128R 3,925,065
134C 3,925,066
142 3,925,067
159 3,925,070
170 3,925,071
171 3,925,072
173C 3,925,073
174 3,925,068

CLASS 81
121R 3,924,492
177G 3,924,493

CLASS 82
2.7 3,924,494

CLASS 83
5 3,924,495
3,924,496
16 3,924,497
58 3,924,498
96 3,924,499
167 3,924,500
404.3 3,924,501
454 3,924,502
488 3,924,503
568 3,924,504

CLASS 84
1.01 3,924,505

CLASS 85
8.1 3,924,506
9R 3,924,507
41 3,924,508
68 3,924,509

CLASS 86
1R 3,924,510

CLASS 89
1.8 3,924,511
128 3,924,512

CLASS 91
224 3,924,513
420 3,924,514
472 3,924,515
491 3,924,516

CLASS 92
2 3,924,517
34 3,924,518
92 3,924,519

CLASS 93
35SB 3,924,521
84TW 3,924,522
87 3,924,523

CLASS 96
1.8 3,925,074
3 3,925,075
33 3,924,520
35.1 3,925,076
3,925,077
36.2 3,925,078
38.1 3,925,079
67 3,925,080
72 3,925,081
76R 3,925,082
101 3,925,084
3,925,085
109 3,925,086
114 3,925,083

CLASS 98
2.11 3,924,524

CLASS 99
303 3,924,525

CLASS 100
25 3,924,526

CLASS 101
88 3,924,527
93.15 3,924,528
123 3,924,529
141 3,924,530
147 3,924,531
426 3,924,532
467 3,924,533

CLASS 102
43R 3,924,534
70.2P 3,924,536
70.2R 3,924,535

CLASS 104
148LM 3,924,537
148MS 3,924,538
258 3,924,539

CLASS 105
197R 3,924,540
221K 3,924,541
226 3,924,542
257 3,924,543
366B 3,924,544
450 3,924,545

CLASS 106
14 3,925,087
20 3,925,088
53 3,925,089
87 3,925,090
100 3,925,091
281R 3,925,092
287SB 3,925,093
288Q 3,925,094
308N 3,925,095
309 3,925,096

CLASS 109
3 3,924,546

CLASS 110
8C 3,924,548
8E 3,924,547

CLASS 112
104 3,924,549
130 3,924,550
153 3,924,551
217.1 3,924,552
219B 3,924,553
252 3,924,554

CLASS 114
126 3,924,555

CLASS 115
35 3,924,556
38 3,924,557

CLASS 116
28R 3,924,558
109 3,924,559
140 3,924,560

CLASS 118
9 3,924,561
49.1 3,924,563
60 3,924,564
320 3,924,562
323 3,924,565
637 3,924,566
3,924,567
3,924,568
642 3,924,569

CLASS 119
5 3,924,570
15 3,924,571
17 3,924,572
61 3,924,573

CLASS 122
23 3,924,574
34 3,924,575

CLASS 123
1R 3,924,576
8.01 3,924,577
8.13 3,924,578
8.23 3,924,579
8.45 3,924,581
30C 3,924,580
32JV 3,924,583
32SP 3,924,582
32ST 3,924,584
3,924,598
41.12 3,924,585
117A 3,924,586
119A 3,924,587
3,924,589
119B 3,924,588
122AB 3,924,590
3,924,592
122H 3,924,591
140CC 3,924,594
140MC 3,924,593
148E 3,924,595
198D 3,924,596
198E 3,924,597

CLASS 124
15 3,924,599
36 3,924,600

CLASS 126
21R 3,924,601
214A 3,924,602
263 3,924,603
270 3,924,604
307A 3,924,605

CLASS 127
44 3,925,097

CLASS 128

2B	3,924,608
2W	3,924,607
2.06R	3,924,610
2.08	3,924,611
	3,924,612
2.1B	3,924,606
2.1R	3,924,609
24R	3,924,613
80J	3,924,615
142.3	3,924,616
	3,924,618
	3,924,619
221	3,924,617
252	3,924,620
	3,924,621
260	3,924,622
269	3,924,623
276	3,924,624
278	3,924,625
287	3,924,626
	3,924,627
303.1	3,924,628
325	3,924,629
339	3,924,630
346	3,924,631
348	3,924,632
349B	3,924,634
349R	3,924,633
350V	3,924,635
351	3,924,636
	3,924,637
359	3,924,638
418	3,924,639
419PG	3,924,641
419P	3,924,640

CLASS 131

2	3,924,642
10A	3,924,643
17R	3,924,644
140A	3,924,645

CLASS 132

79R	3,924,646
92R	3,924,647

CLASS 136

6LF	3,925,098
86A	3,925,100
86C	3,925,099
100R	3,925,101
111	3,925,102
202	3,925,103
225	3,925,104

CLASS 137

3	3,924,648
15	3,924,649
101	3,924,650
115	3,924,651
119	3,924,652
236	3,924,653
322	3,924,654
596.13	3,924,655
596.14	3,924,656
596.15	3,924,657
604	3,924,658
630.17	3,924,659
637.1	3,924,660

CLASS 138

110	3,924,661

CLASS 139

302	3,924,662
420R	3,924,663

CLASS 140

92.7	3,924,664
	3,924,665

CLASS 141

231	3,924,666

CLASS 144

3D	3,924,667
244	3,924,668

CLASS 148

1.5	3,925,105
	3,925,106
	3,925,107
6.35	3,925,109
11.5R	3,925,110
12F	Re.28,645
	3,925,111
25	3,925,112
29	3,925,113
105	3,925,114
112	3,925,115
143	3,925,116
171	3,925,117
175	3,925,118
	3,925,119
	3,925,120
189	3,925,121

CLASS 149

2	3,925,122
60	3,925,123
74	3,925,124
96	3,925,125

CLASS 150

52R	3,924,669

CLASS 152

375	3,924,670

CLASS 156

73.6	3,925,126
85	3,925,127
96	3,925,128
	3,925,129
148	3,925,130
159	3,925,131
161	3,925,132
175	3,925,133
178	3,925,134
213	3,925,135
252	3,925,136
278	3,925,137
313	3,925,138
358	3,925,139
382	3,925,140
416	3,925,141
425	3,925,142
505	3,925,143
518	3,925,144
579	3,925,145
601	3,925,146
603	3,925,147
618	3,925,108

CLASS 159

23	3,925,148
47	3,925,149

CLASS 160

183	3,924,671

CLASS 162

4	3,925,150

CLASS 164

252	3,924,672
274	3,924,673
304	3,924,422

CLASS 165

32	3,924,674
134	3,924,675
172	3,924,676

CLASS 166

100	3,924,677
120	Re.28,641
	3,924,678
182	3,924,679
258	3,924,680
270	3,924,681
274	3,924,682
303	3,924,683
307	3,924,684
308	3,924,685
315	3,924,686

CLASS 169

19	3,924,687
61	3,924,688

CLASS 172

413	3,924,694
780	3,924,689

CLASS 173

13	3,924,690
48	3,924,691
117	3,924,692
169	3,924,693

CLASS 174

17LF	3,925,592
36	3,925,593
42	3,925,594
	3,925,595
68.5	3,925,596
102SC	3,925,597
108	3,925,598
150	3,925,599

CLASS 175

69	3,924,695
209	3,924,696
382	3,924,697
393	3,924,698

CLASS 176

68	3,925,151

CLASS 177

16	3,924,699
118	3,924,700

CLASS 178

3	3,925,600
	3,925,601
6.6B	3,925,602
6.6R	3,925,603
	3,925,604
	3,925,605
6.8	3,925,606
7.1	3,925,607
	3,925,608
7.3D	3,925,609
18	3,925,610
22	3,925,611
	3,925,612
69.5TV	3,925,613
88	3,925,614

CLASS 179

1GQ	3,925,615
1SC	3,925,616
1VC	3,925,618
6R	3,925,617
6.3R	3,925,619
15AL	3,925,621
15AT	3,925,620
18BE	3,925,622
18FH	3,925,623
81R	3,925,624
99	3,925,625
100.41K	3,925,628
115.5R	3,925,626
181W	3,925,627

CLASS 180

6.48	3,924,702
6.5	3,924,701
9.54	3,924,703
41	3,924,704
79.2R	3,924,705
89A	3,924,706
90	3,924,707

CLASS 184

105R	3,924,708

CLASS 186

1AC	3,924,709

CLASS 187

19	3,924,710

CLASS 188

73.3	3,924,711
264F	3,924,712
296	3,924,713

CLASS 190

18R	3,924,714

CLASS 192

18A	3,924,715
57	3,924,716
86	3,924,717

CLASS 193

35R	3,924,718

CLASS 194

10	3,924,719

CLASS 195

1.5	3,925,152
1.8	3,925,153
28N	3,925,154
36P	3,925,155
51R	3,925,156
63	3,925,157
66R	3,925,158
73	3,925,159
96	3,925,160
100	3,925,161
103.5R	3,925,162
	3,925,163
	3,925,164
127	3,925,165
139	3,925,166

CLASS 197

6.5	3,924,720
18	3,924,721
19	3,924,722
	3,924,723
52	3,924,724
53	3,924,725
55	3,924,726
151	3,924,727
172	3,924,728

CLASS 198

39	3,924,729
220R	3,924,730
268	3,924,731
287	3,924,732

CLASS 200

38R	3,925,629
39R	3,925,630
148R	3,925,631
307	3,925,632

CLASS 202

174	3,925,167

CLASS 204

1T	3,925,168
	3,925,169
43N	3,925,170
56R	3,925,171
72	3,925,172
73R	3,925,173
95	3,925,174
109	3,925,175
152	3,925,176
159.15	3,925,349
164	3,925,177
165	3,925,178
181	3,925,179
	3,925,180
	3,925,181
192	3,925,182
195R	3,925,183
229	3,925,184
252	3,925,185
256	3,925,186
298	3,925,187

CLASS 206

1.7	3,924,733
44R	3,924,734
45.11	3,924,735
45.14	3,924,736
84	3,924,737
150	3,924,738
157	3,924,739
187	3,924,740
221	3,924,741
387	3,924,742
389	3,924,743
460	3,924,744
484	3,924,745
530	3,924,746
531	3,924,747
534.1	3,924,748

CLASS 208

8	3,925,188
11	3,925,189
	3,925,190
91	3,925,193
109	3,925,194
111	3,925,191
120	3,925,195
139	3,925,196
216	3,925,197

CLASS 209

3	3,925,198
	3,925,199
9	3,925,200

CLASS 210

22	3,925,201
32	3,925,202
38	3,925,192
44	3,925,203
73	3,925,204
	3,925,205
104	3,925,206
138	3,925,207
199	3,925,208
304	3,925,209
335	3,925,210
500M	3,925,211

CLASS 211

4	3,924,749
13	3,924,750
17	3,924,751

CLASS 212

39MS	3,924,752
48	3,924,753

CLASS 214

1BD	3,924,754
1P	3,924,755
6A	3,924,756
6B	3,924,757
7	3,924,758
8.5D	3,924,759
16.1ED	3,924,760
16.4A	3,924,300
17CB	3,924,761
38B	3,924,762
86A	3,924,763
450	3,924,764
518	3,924,765
764	3,924,766

CLASS 215

12R	3,924,767
213	3,924,768
216	3,924,769
220	3,924,770
246	3,924,771
276	3,924,772

CLASS 219

10.49	3,925,633
76	3,925,634
89	3,925,635
104	3,925,636
105	3,925,637
295	3,925,638

CLASS 220

88B	3,924,773
93	3,924,774
96	3,924,775
269	3,924,776
277	3,924,777
314	3,924,778

CLASS 221

67	3,924,779

CLASS 222

64	3,924,780
80	3,924,781
134	3,924,783
176	3,924,784
402.11	3,924,782

CLASS 223

2	3,924,785

CLASS 224

5V	3,924,786
42.03B	3,924,787

CLASS 227

67	3,924,788
131	3,924,789
148	3,924,790

CLASS 228

1	Re.28,642
110	3,924,791
118	3,924,792
157	3,924,793
256	3,924,794

CLASS 229

4.5	3,924,795
17G	3,924,796
	3,924,797
23AB	3,924,798
39B	3,924,799
39R	3,924,800
	3,924,801
54R	3,924,802
87F	3,924,803

CLASS 233

19A	3,924,804

CLASS 235

61.11E	3,925,639
150.1	3,925,640
150.2	3,925,641
150.25	3,925,642
	3,925,643
151.21	3,925,645
151.3	3,925,644
152	3,925,646
153BB	3,925,647
156	3,925,648
159	3,925,649
164	3,925,650
175	3,925,651
	3,925,652
181	3,925,653
197	3,925,654

CLASS 239

1	3,924,805
8	3,924,806
55	3,924,807
102	3,924,808
230	3,924,809
305	3,924,810
533	3,924,811
550	3,924,812

CLASS 240

2CL	3,925,655
7.1LJ	3,925,656

CLASS 241

4	3,924,813
80	3,924,814
209	3,924,815

CLASS 242

7.05B	3,924,816
18G	3,924,817
47.05	3,924,818
85.1	3,924,819
156	3,924,820
195	3,924,821
198	3,924,822
	3,924,823

CLASS 244

3.2	3,924,824
46	3,924,825
129W	3,924,826
153R	3,924,827

CLASS 248

179	3,924,828
243	3,924,829
358A	3,924,830

CLASS 250

211J	3,925,657
	3,925,658
270	3,925,659
272	3,925,660
	3,925,661
290	3,925,662
292	3,925,663
310	3,925,664
337	3,925,665
338	3,925,666
343	3,925,667
351	3,925,668
370	3,925,669
372	3,925,244
400	3,925,670
	3,925,671
402	3,925,672
432	3,925,673
483	3,925,674
485	3,925,675
499	3,925,676
505	3,925,677
508	3,925,678
527	3,925,212

CLASS 251

149.7	3,924,831
301	3,924,832

CLASS 252

18	3,925,213
21	3,925,214
47.5	3,925,215
49.3	3,925,216
52A	3,925,217
61	3,925,218
62.1P	3,925,219
63	3,925,220
63.7	3,925,221
	3,925,222
78	3,925,223
89	3,925,224
90	3,925,225
92	3,925,226
106	3,925,227
110	3,925,228
136	3,925,229
	3,925,230
171	3,925,231
	3,925,232
182	3,925,233
186	3,925,234
188.3CL	3,925,235
299	3,925,236
	3,925,237
	3,925,238
301.4P	3,925,239
301.4S	3,925,240
316	3,925,241
321	3,925,242
359C	3,925,243
389A	3,925,245
400R	3,925,246
428	3,925,248
429R	3,925,247
430	3,925,249
437	3,925,250
441	3,925,251
447	3,925,252
455R	3,925,253
455Z	3,925,254
456	3,925,255
463	3,925,256
	3,925,257
467	3,925,258
470	3,925,259
519	3,925,261
526	3,925,262
543	3,925,260

CLASS 256

22	3,924,834
24	Re.28,643

CLASS 259

6	3,924,835
7	3,924,836
8	3,924,837
108	3,924,838
191	3,924,839
	3,924,840
	3,924,841
192	3,924,842

CLASS 260

2H	3,925,263
2.1E	3,925,264
2.5AC	3,925,268
	3,925,284
2.5AJ	3,925,265
2.5AM	3,925,266
2.5B	3,925,269
2.5R	3,925,267
	3,925,270
3	3,925,271
4	3,925,272
17A	3,925,273
17.4CL	3,925,275
17.4GC	3,925,274
18S	3,925,276
	3,925,277
22CB	3,925,279
22R	3,925,278
23AR	3,925,281
23H	3,925,282
23R	3,925,280
24	3,925,283
29.1SB	3,925,285
29.3	3,925,286
29.6AN	3,925,291
29.6TA	3,925,287
	3,925,288
	3,925,293
29.6WB	3,925,290
29.6B	3,925,289
29.6F	3,925,292
29.7SQ	3,925,294
34.2	3,925,295
37EP	3,925,297
37N	Re.28,646
	3,925,296
39	3,925,298
40R	3,925,299
	3,925,300
42	3,925,301
42.46	3,925,302
45.7P	3,925,303

45.75N 3,925,308
45.75R 3,925,307
45.75S 3,925,309
45.8N 3,925,304
45.9NC 3,925,305
3,925,306
47CP 3,925,311
3,925,312
3,925,313
47CZ 3,925,310
47EN 3,925,315
47UA 3,925,314
63R 3,925,317
75NT 3,925,319
77.5CR 3,925,320
78UA 3,925,324
78L 3,925,325
78S 3,925,321
3,925,323
78.4E 3,925,322
78.5UA 3,925,327
78.5B 3,925,330
78.5R 3,925,326
3,925,329
78.5T 3,925,328
79 3,925,331
79.3R 3,925,332
79.5B 3,925,333
80.78 3,925,334
87.3 3,925,336
87.5C 3,925,337
88.2R 3,925,338
92.1 3,925,339
92.3 3,925,340
93.7 3,925,341
97.5 3,925,342
112G 3,925,343
112.5 3,925,344
3,925,345
145A 3,925,346
147 3,925,347
157 3,925,348
165 3,925,350
196 3,925,351
210AB 3,925,353
3,925,354
210E 3,925,352
210K Re.28,647
210.5 3,925,355
214 3,925,356
239BC 3,925,359
239BD 3,925,358
3,925,361
239E 3,925,360
239.1 3,925,357
3,925,362
3,925,363
239.3A 3,925,365
239.3D 3,925,364
239.3P 3,925,366
239.65 3,925,367
240J 3,925,368
243A 3,925,369
243C 3,925,370
3,925,372
3,925,373
243R 3,925,371
247 3,925,374
247.1E 3,925,375
248CS 3,925,376
248C 3,925,377
250AC 3,925,379
250A 3,925,381
250B 3,925,378
250Q 3,925,380
251QB 3,925,382
256.4F 3,925,383
3,925,385
256.4Q 3,925,384
260 3,925,386
268BC 3,925,388
268PH 3,925,387
268SY 3,925,389
281NH 3,925,390
288R 3,925,391
293.53 3,925,392
3,925,393
293.83 3,925,394
294.8F 3,925,396
294.8G 3,925,395
294.9 3,925,397
296N 3,925,398
299 3,925,399
306.5 3,925,401
306.7R 3,925,400
306.8D 3,925,402
3,925,403
307R 3,925,404
308R 3,925,405
309.5 3,925,406
3,925,407
311 3,925,408
326.25 3,925,411
326.47 3,925,412
326.5B 3,925,409
326.8 3,925,410

327M 3,925,413
327R 3,925,414
335 3,925,415
3,925,416
338 3,925,417
340.6 3,925,418
340.9 3,925,419
3,925,420
343 3,925,421
343.2F 3,925,423
343.2R 3,925,422
346.3 3,925,424
346.4 3,925,425
369 3,925,426
380 3,925,427
404 3,925,429
3,925,430
3,925,431
429.7 3,925,432
438.5R 3,925,433
448.2E 3,925,434
453PC 3,925,436
453SP 3,925,437
453P 3,925,435
456A 3,925,438
3,925,439
457 3,925,440
458 3,925,441
459R 3,925,443
459 3,925,442
463 3,925,444
465C 3,925,447
465E 3,925,446
465R 3,925,445
465.3 Re.28,648
465.5A 3,925,448
465.5R 3,925,449
468D 3,925,450
3,925,451
468H 3,925,459
3,925,460
471C 3,925,461
486R 3,925,462
497A 3,925,463
501.12 3,925,452
3,925,453
502.4P 3,925,454
502.5 3,925,455
517 3,925,456
523A 3,925,457
530N 3,925,458
535P 3,925,464
543R 3,925,465
551P 3,925,466
556A 3,925,467
562B 3,925,468
564RF 3,925,469
3,925,470
566AE 3,925,471
566A 3,925,473
570.5P 3,925,472
570.8TC 3,925,474
570.8R 3,925,476
586E 3,925,475
586F 3,925,480
586G 3,925,478
3,925,477
586R 3,925,479
597R 3,925,316
612R 3,925,481
613R 3,925,482
615B 3,925,483
617F 3,925,484
617R 3,925,486
619A 3,925,485
619B 3,925,487
623R 3,925,488
643B 3,925,489
653.3 3,925,490
653.9 3,925,491
654R 3,925,492
666A 3,925,493
666P 3,925,494
669R 3,925,495
677R 3,925,496
680E 3,925,497
3,925,498
683.44 3,925,499
683.48 3,925,500
3,925,501
683.58 3,925,502
683.65 3,925,318
823 3,925,503
3,925,504
836 3,925,505
3,925,506
859R 3,925,507
876R 3,925,335
3,925,508
3,925,509
877 3,925,510
880B 3,925,511
883 3,925,512
889 3,925,513
932 3,925,514
3,925,515

940 3,925,516
944 3,925,517
958 3,925,518
967 3,925,519
979 3,925,520

CLASS 261

39A 3,925,521
92 3,925,522
151 3,925,523

CLASS 264

29 3,925,524
40 3,925,525
45.5 3,925,526
53 3,925,527
54 3,925,528
244 3,925,529
297 3,925,530

CLASS 269

20 3,924,843
94 3,924,844

CLASS 270

54 3,924,845
56 3,924,846

CLASS 271

3 3,924,847
10 3,924,848
277 3,924,849

CLASS 272

57H 3,924,850
67 3,924,851

CLASS 273

1M 3,924,852
29A 3,924,853
85B 3,924,854
95AA 3,924,855
106R 3,924,856
113 3,924,857
134AC 3,924,858
137C 3,924,859

CLASS 274

1L 3,924,860

CLASS 277

185 3,924,861
231 3,924,862
235B 3,924,863

CLASS 280

11.13B 3,924,864
11.13N 3,924,865
11.35D 3,924,869
11.35K 3,924,868
11.35N 3,924,866
11.35T 3,924,867
11.37S 3,924,870
12R 3,924,871
47.37 3,924,872
124R 3,924,873
150SB 3,924,875
150B 3,924,874
150.5 3,924,876
507 3,924,878

CLASS 282

28R 3,924,879

CLASS 285

61 3,924,880
156 3,924,881
175 3,924,882
256 3,924,883
340 3,924,877

CLASS 290

1 3,925,679

CLASS 292

196 3,924,884
262 3,924,885
263 3,924,886
283 3,924,887

CLASS 293

76 3,924,888

CLASS 296

137B 3,924,889

CLASS 297

16 3,924,890
334 3,924,891
440 3,924,892
455 3,924,893
460 3,924,894

CLASS 299

8 3,924,895
18 3,924,896
36 3,924,897

CLASS 301

108SC 3,924,898

CLASS 302

35 3,924,899
49 3,924,900
64 3,924,901

CLASS 303

21BE 3,924,903
21A 3,924,902

CLASS 305

10 3,924,904
12 3,924,905

CLASS 307

39 3,925,680
117 3,925,681
134 3,925,682
141 3,925,683
203 3,925,684
205 3,925,685
3,925,686
233R 3,925,687
252B 3,925,688
260 3,925,689
270 3,925,690
300 3,925,691

CLASS 308

1R 3,924,906
3R 3,924,907
20 3,924,908
136 3,924,909
156 3,924,910
187.1 3,924,911
212 3,924,912

CLASS 310

8.7 3,925,692
9.1 3,925,693
68D 3,925,694
72 3,925,695
242 3,925,696

CLASS 312

258 3,924,913

CLASS 313

223 3,925,697
346 3,925,698
384 3,925,699
403 3,925,700

CLASS 315

5.38 3,925,701
12 3,925,702
169TV 3,925,703
200A 3,925,704
246 3,925,705
383 3,925,706

CLASS 317

11A 3,925,707
13R 3,925,708
33VR 3,925,709
100 3,925,710
123 3,925,711
262E 3,925,712

CLASS 318

575 3,925,713

CLASS 320

39 3,925,714

CLASS 321

2 3,925,715
3,925,716
3,925,717

CLASS 323

4 3,925,718
16 3,925,719
22SC 3,925,720

CLASS 324

.5R 3,925,721
28CH 3,925,723
28R 3,925,722
34R 3,925,724
3,925,725
72 3,925,726
121R 3,925,727
142 3,925,728

CLASS 325

17 3,925,729
32 3,925,730
38B 3,925,731
325 3,925,732

CLASS 328

51 3,924,614
140 3,925,733

CLASS 331

41 3,925,734

CLASS 332

7.51 3,925,735
43B 3,925,736

CLASS 333

6 3,925,737
31R 3,925,738
76 3,925,739
82B 3,925,740

CLASS 335

140 3,925,741
186 3,925,742

CLASS 336

70 3,925,743
84 3,925,744

CLASS 337

279 3,925,745
309 3,925,746

CLASS 338

33 3,925,747
57 3,925,748

CLASS 339

14P 3,924,914
17LC 3,924,916
17F 3,924,915
3,924,917
17M 3,924,918
60C 3,924,919
246 3,924,920
252P 3,924,921
259R 3,924,922
278M 3,924,923

CLASS 340

18P 3,925,749
27AT 3,925,751
27NA 3,925,750
52D 3,925,754
52F 3,925,752
52R 3,925,753
58 3,925,755
59 3,925,756
66 3,925,757
73 3,925,758
81R 3,925,759
146.3ED 3,925,760
146.3WD 3,925,761
150 3,925,762
164R 3,925,763
168R 3,925,764
172.5 3,925,765
3,925,766
173LM 3,925,767
174TF 3,925,768
3,925,769
228S 3,925,770
249 3,925,771
253C 3,925,772
258A 3,925,773
3,925,774
324AD 3,925,776
324R 3,925,775
336 3,925,777
337 3,925,779
347DD 3,925,780
378R 3,925,778

CLASS 343

106R 3,925,781
178 3,925,782
705 3,925,783
754 3,925,784

CLASS 346

1 3,925,785
24 3,925,786
75 3,925,787
3,925,788
3,925,789
140 3,925,790
3,925,791

CLASS 350

3.5 3,924,924
3,924,925
34 3,924,926
96B 3,924,927
99 3,924,928
103 3,924,929
157 3,924,930
160LC 3,924,932
160R 3,924,931
181 3,924,933
184 3,924,934
214 3,924,935
252 3,924,936
285 3,924,937
302 3,924,938

CLASS 352

34 3,924,939
75 3,924,940
78R 3,924,941

CLASS 353

25 3,924,942

CLASS 354

60 3,925,792
62 3,925,793
70 3,925,794
139 3,925,795
180 3,925,796
197 3,925,797
215 3,925,798
235 3,925,799
301 3,925,800

CLASS 355

3DD 3,924,944
3R 3,924,943
10 3,924,945
18 3,924,946

CLASS 356

39 3,924,947
71 3,924,948
73 3,924,949
82 3,924,950
102 3,924,951

106S 3,924,952
167 3,924,953
188 3,924,954

CLASS 357

19 3,925,801
20 3,925,802
22 3,925,803
23 3,925,804
24 3,925,805
3,925,806
55 3,925,807
67 3,925,808
81 3,925,809

CLASS 358

4 3,925,810
8 3,925,811
51 3,925,812
55 3,925,813

CLASS 360

2 3,925,814
14 3,925,815
19 3,925,816
74 3,925,817
106 3,925,818
3,925,819
132 3,925,820

CLASS 403

230 3,924,955
231 3,924,956
352 3,924,957

CLASS 404

15 3,924,958

CLASS 415

1 3,924,959
28 3,924,960
32 3,924,961
90 3,924,962
143 3,924,963
210 3,924,964

CLASS 416

114 3,924,965
177 3,924,966

CLASS 417

51 3,924,967
53 3,924,968
218 3,924,969
220 3,924,970
286 3,924,971
310 3,924,972
320 3,924,973
322 3,924,974
395 3,924,975

CLASS 418

8 3,924,976
55 3,924,977
60 3,924,978
142 3,924,979
191 3,924,980

CLASS 423

76 3,925,531
132 3,925,532
150 3,925,533
208 3,925,534
213.2 3,925,535
258 3,925,536
277 3,925,537
390 3,925,538
394 3,925,428
464 3,925,539
478 3,925,540

CLASS 424

12 3,925,541
47 3,925,542
52 3,925,543
89 3,925,544
92 3,925,545
116 3,925,546
195 3,925,547
251 3,925,548
3,925,549
270 3,925,550
273 3,925,551
3,925,552
3,925,553
274 3,925,554
321 3,925,555
329 3,925,556
331 3,925,557
3,925,558

CLASS 425

24 3,924,981
35 3,924,982
38 3,924,983
68 3,924,984
72 3,924,985
130 3,924,989
131.1 3,924,990
190 3,924,991
233 3,924,992
242R 3,924,993
3,924,994
243 3,924,995

348R	3,924,996		3,925,560		CLASS 427		304	3,925,578	40	3,925,584	CLASS 431
376	3,924,997	250	3,925,561				320	3,925,579	42	3,925,585	4 3,925,001
387B	3,924,998	276	3,925,562	46	3,925,570		372	3,925,580	195	3,925,586	10 3,925,002
392	3,924,999	302	3,925,563	76	3,925,571		377	3,925,581	255	3,925,587	89 3,925,003
422	3,925,000	418	3,925,564	87	3,925,572		385	3,925,582	395	3,925,588	131 3,925,004
451.2	3,924,986	447	3,925,565	145	3,925,573					3,925,589	
451.5	3,924,987		3,925,566	195	3,925,574		CLASS 428		423	3,925,590	CLASS 432
461	3,924,988	559	3,925,567	226	3,925,575				483	3,925,591	82 3,925,005
	CLASS 426	618	3,925,568	230	3,925,576		36	3,925,583			
2	3,925,559	634	3,925,569	249	3,925,577						

CLASSIFICATION OF DESIGNS

D2—	28	237,914			237,931		173	237,947	D19—	97	238,005	D32—	1R	237,981	D48— 32R 237,998
D6—	23	237,915		191	237,932	D10—	50	237,949	D23—	1	237,965		2C	237,982	237,999
	37	237,916		244	237,933		62	237,950		35	237,966	D34—	5CC	237,984	D55— 1D 238,001
	47	237,917	D7—	62	237,934		96	237,951		38	237,967		QQ	237,983	R 238,000
	49	237,918		88	237,935		116	237,952		40	237,968		SS	237,985	D61— N 238,002
		237,919	D8—	57	237,936	D12—	29	237,953		71	237,969			237,986	D64— 11R 238,003
	56	237,920			237,937			237,954		87	237,970			237,987	238,004
	63	237,921		59	237,938			237,955		151	237,971		ST	237,988	D83— 1J 238,007
	68	237,922			237,939		69	237,956		165	237,972			237,990	Q 238,006
	73	237,923		71	237,940		78	237,957	D26—	4	237,973		K	237,989	D86— 8 238,008
	85	237,924		235	237,941		105	237,958		5C	237,974		14C	237,991	10F 238,009
	89	237,925	D9—	2	237,942		118	237,959			237,975			237,992	D87— 1R 238,010
	91	237,926		63	237,943		173	237,960			237,976		15AC	237,993	238,011
	114	237,927		100	237,944		186	237,961		R	237,977	D35—	1	237,994	3C 238,012
	162	237,928		127	237,945	D13—	1L	237,964		14B	237,978	D40—	5	237,995	D92— 4R 238,013
	175	237,929		128	237,946		R	237,962		15	237,979			237,996	238,014
	179	237,930		164	237,948			237,963	D30—	13	237,980	D45—	10B	237,997	238,015

CLASSIFICATION OF PLANTS

P. —	49	3,814				

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

3,924,510	3,924,654	3,925,520	3,924,778	3,924,639	3,924,634
3,924,791	3,924,659	3,925,553	3,924,782	3,924,648	3,924,647
3,924,920	3,924,674	3,925,596	3,924,837	3,924,652	3,924,656
3,925,424	3,924,678	3,925,604	3,924,859	3,924,878	3,924,692
1 : 3,924,288	3,924,679	3,925,607	3,924,931	3,924,947	3,924,694
3,924,344	3,924,688	3,925,623	3,924,950	3,925,024	3,924,703
3,925,410	3,924,700	3,925,633	3,924,953	3,925,053	3,924,720
3,925,721	3,924,701	3,925,638	3,924,958	3,925,315	3,924,734
2 : 3,925,302	3,924,733	3,925,639	3,924,960	3,925,630	3,924,751
4 : 3,924,388	3,924,735	3,925,648	3,924,985	3,925,711	3,924,766
3,924,638	3,924,738	3,925,653	3,925,014	3,925,750	3,924,776
3,924,695	3,924,768	3,925,660	3,925,067	3,925,784	3,924,777
3,925,218	3,924,787	3,925,664	3,925,136	3,925,806	3,924,784
3,925,651	3,924,805	3,925,670	3,925,143	13 : 3,924,289	3,924,789
3,925,652	3,924,808	3,925,683	3,925,157	3,924,636	3,924,800
5 : 3,924,847	3,924,809	3,925,684	3,925,168	3,924,663	3,924,807
3,925,092	3,924,828	3,925,690	3,925,172	3,924,719	3,924,819
6 : 3,924,279	3,924,844	3,925,691	3,925,270	3,924,740	3,924,832
3,924,287	3,924,856	3,925,704	3,925,308	3,924,801	3,924,871
3,924,292	3,924,862	3,925,710	3,925,319	3,924,813	3,924,877
3,924,307	3,924,885	3,925,715	3,925,409	3,924,901	3,924,882
3,924,333	3,924,886	3,925,746	3,925,466	3,925,005	3,924,907
3,924,337	3,924,887	3,925,765	3,925,511	3,925,417	3,924,998
3,924,340	3,924,890	3,925,769	3,925,597	3,925,421	3,925,025
3,924,341	3,924,915	3,925,775	3,925,642	3,925,680	3,925,027
3,924,352	3,924,921	3,925,777	3,925,643	15 : Re.28,641	3,925,054
3,924,354	3,924,922	3,925,780	3,925,654	16 : 3,924,699	3,925,113
3,924,360	3,924,930	3,925,781	3,925,655	17 : Re.28,642	3,925,188
3,924,405	3,924,932	3,925,796	3,925,729	3,924,301	3,925,349
3,924,414	3,924,967	3,925,801	10 : 3,924,714	3,924,309	3,925,402
3,924,415	3,924,973	3,925,805	3,924,872	3,924,325	3,925,403
3,924,442	3,924,980	7 : 3,924,519	3,924,941	3,924,351	3,925,475
3,924,458	3,924,999	8 : 3,924,452	3,925,009	3,924,373	3,925,502
3,924,468	3,925,055	3,924,493	3,925,030	3,924,427	3,925,541
3,924,476	3,925,056	3,924,628	3,925,074	3,924,438	3,925,544
3,924,511	3,925,070	3,924,680	3,925,220	3,924,485	3,925,559
3,924,513	3,925,079	3,924,881	3,925,254	3,924,488	3,925,565
3,924,530	3,925,098	3,924,939	3,925,323	3,924,498	3,925,566
3,924,533	3,925,103	3,925,039	3,925,334	3,924,505	3,925,569
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3,924,557	3,925,190	9 : 3,924,338	3,925,462	3,924,527	3,925,819
3,924,558	3,925,192	3,924,379	3,925,497	3,924,539	18 : 3,924,315
3,924,568	3,925,307	3,924,387	3,925,537	3,924,540	3,924,323
3,924,579	3,925,342	3,924,454	3,925,574	3,924,541	3,924,403
3,924,583	3,925,385	3,924,532	11 : 3,924,827	3,924,542	3,924,422
3,924,599	3,925,428	3,924,598	12 : 3,924,294	3,924,545	3,924,501
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3,924,603	3,925,460	3,924,641	3,924,365	3,924,615	3,924,622
3,924,612	3,925,461	3,924,727	3,924,472	3,924,623	3,924,632

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DESIGN PATENTS

1 : 237,941
4 : 237,940
6 : 237,924
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35 : 237,962
36 : 237,926
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37 : 237,918
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39 : 237,917
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41 : 237,931
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42 : 237,942
48 : 237,968
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49 : 237,963
53 : 237,972
55 : 237,995
238,002

PLANT PATENTS

55 : 3,814

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